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AN AMPLIFIED BONWILL TECHNIC MAKING COHESIVE GOLD OPERATIONS A COMPARATIVE PASTIME[1]

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(Read before the National Dental Association, Milwaukee, Wisconsin, August 15-19, 1921)

I HAVE three distinct subjects to which I wish to direct your attention: (1) The many excellencies of the present day Bonwill mechanical mallet, when operated on an electrically driven engine. (2) The marvellous desiccating features of oxygen in the discarding of the rubber-dam in many foil operations. These will be described later on. (3) I will attempt a clear explanation of the failure of the Bonwill mallet to attain a greatly deserved popularity.

The oxygen employed is the commercial product used very widely in welding and therefore obtainable everywhere.

For brevity I have used the word foil freely. Any one reputable make of foil or cylinders will serve my needs quite as well as another. I do not favor the use of an electric annealer.

Just what to say to enlist the kindly interest of the dental profession, the majority of which has employed other methods, than the one I present, has been my chief study.

Space does not permit a lengthy discussion of the subject of foil operations and after deep study I shall therefore, with close adherence to the subject, present a bare submission of the Bonwill based upon an experience of more than thirty years.

[1]Editor's Note: Dr. Southwell's paper opened with a full reel of cinema that illustrated many of the features of his paper.

Let me first relate that which I expect to illustrate.

1. The condensation of gold in the average accessible cavity is very easily accomplished with the latest type of the Bonwill mallet together with a class of plugging points that very closely follow those originally devised by Dr. Bonwill.

2. With a normal blow one may easily, precisely and confidently approach and seal all margins.

3. The gold may not only be boldly directed to and driven over the margins but the enamel margin may be made to do its share in the chiseling of the excess enroute. May be made to serve as the other blade of scissors as it were. May be made to serve quite as mother makes the pie tin do its share of the cutting when she poises the plate on one hand and trims away the surplus pie crust with a knife in the other. I expect to show that this may be done with apparent abandon not only on the lateral walls of approximal cavities of molars and bicuspids but cervically as well.

4. Furthermore I will demonstrate that all of the above may be accomplished without the aid of the rubberdam, clamp, matrix, ligatures or previous treatment of the gum, in all normal and accessible cavities in the upper jaw anterior to the distal surface of the first molar.

5. And that in the control of moisture nothing will be used other than one small cotton roll and a continuous, mild flow of oxygen from an ordinary chip blower nozzle held by an assistant. To encourage your belief in this departure, even though it takes on a suggestion of the vaudeville, I beg to, in addition, say that it is all so simple and so feasible that it is one's privilege to slightly moisten the cotton roll in advance, in order that it may, more comfortably, be adapted to the gums. The roll, unless made too moist, will become sufficiently dry as soon as the gums become desiccated.

Permit me to go farther and say that if, in a normally accessible cavity, the gum line is approached or if it be intruded upon, or if the cavity is only reasonably beyond the gum line—nay, even if the gum be moderately abused, one may depend on the above directed use of the oxygen. Instead of being nerve wracking or audacious I am so unhurried, ordinarily, that I have been known to leave the chair to answer the telephone.

Heed need not be given to the contact of the gold with the gums—no more than if it were dry leather for the thorough desiccation makes it such for the time being.

With gingival cavities in the upper jaw, that extend moderately beneath the gum, one may freely and confidently use nothing but the oxygen and one cotton roll and actually force the gum back with the gold as it is being driven and chiseled over the cavity margins. I renew the statement regarding abused gums, but of course have reference only to an average condition.

The dependability of oxygen, that which is employed in welding everywhere, is so simple and marvelously amenable that I am chagrined to not have hit upon it many years ago.

Arrangements have been made to demonstrate that *after cohesive foil strips have been annealed,* they may be laid, spread and even burnished upon desiccated gums without adversely affecting the cohesion.

And furthermore, that for the purpose of such demonstrations the oxygen need be employed no more than three minutes. In fact, during April of this year, in this particular demonstration, before President Friesell and Harold S. Smith, the time of desiccation was but sixty seconds. However, it is best in one's practice, to begin the flow during the cavity preparation for the reason that when ready for the gold, the desiccation has advanced to the point where the gums may be dealt with with seeming carelessness. Assuming that one question is now being formulated in the minds

of my readers I will say that while a prolonged application produces a very slight blanching of the gums, at the gingival margin, I have noted no adverse effect whatever and that the gums function normally quite as soon as the oxygen is removed.

In practice I have, furthermore, found that the continuation of the desiccation is of great comfort in the disking of the fillings which, through the definite control of excess and the precise management of the contouring enroute, as afforded by the Bonwill, requires but a very few minutes. At times but one or two disks are required.

I wish to call attention to the delightful revivifying effect of the oxygen on the vitiated atmosphere of the patient, operator and assistant.

As I have spoken freely of driving the gold over the cavity margins, at gingival and cervical borders, I cannot refrain from interlopating, at this point, a strong protest against leaving said excess beneath the gum until another sitting, if the finishing for any reason must be deferred. In fact this mention of the gold beneath the gum, is solely an illustration of the control of the plugging point. While gold may be driven over and off and free from the filling, all such overdriven gold must be removed *at the time it is overdriven* and not be permitted to accumulate. The desiccation permits this to be done freely. That it is imperative that such excess be removed I advance three sufficient reasons.

1. That incalculable damage to the interstitial membrane is caused if it is permitted to remain.

2. That much unnecessary soreness and actual suffering is, at times, caused by the excess and it is usually, if not always, charged to the method of condensation, whatever it may be, and not to careless technic.

3. This careful disposal of excess at the remote margins insures one against a bulk of excess that is so often the chief bugbear of foil operations namely, the finishing with the vile strips. This amplified technic which I am offering reduces that maddening period to a minimum.

The absolute mastery of marginal excess and control of contour is a distinct feature of this newer technic and is offered as evidence of the complete precision or control of the plugging point in driving gold over and free from margins. That said mastery may not be understated or that it may be accredited I will add that with a diamond plugging point—one of the old time diamond drills—one may chisel writing into the surface of the thin cover glasses used on microscopic slides without breaking the glass. Writing that is actually chiseled into and not scratched upon the glass which, as you well know, is but eight-thousandths of an inch in thickness or one-half the thickness of the shell of a hen's egg.

Permit me to dwell upon this feat and direct your attention to a feature that could escape attention namely, that in said chiseling of letters the hand is constantly moving over the surface. Otherwise the point would almost instantly cut through (Fig. 1A and 1B).

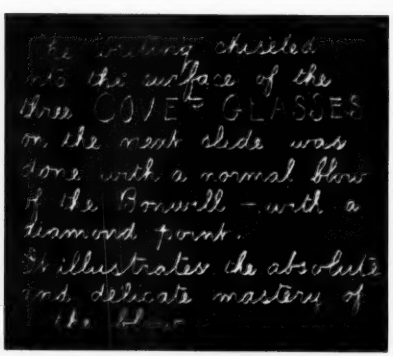
If a grosser illustration of control at the cervical margin be needed I will add that one may boldly skate up to and along the edge of thin ice and even dip a foot in the clear water with no risk of falling in—no risk in other words of slipping into the gums.

Briefly engaging the subject of more kindly operations, it does not seem amiss to enlarge upon the various factors that may be viewed as contributants to the unpopularity of foil. I call to witness the despicable clamp that held the rubber-dam in place at the time of the last large foil operation in your own mouth. I ask you to recall the snapping in and tying down of the ligatures and the clammy curtain of rubber-dam that held you silent. Even with your knowledge of the technic and the value of the service I very seriously question whether it

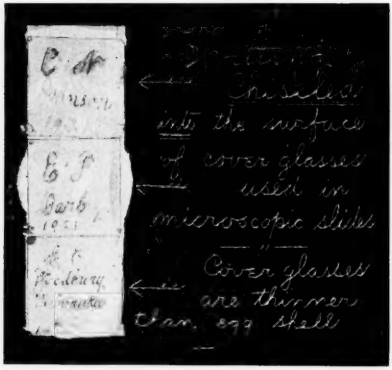
served to popularize foil with you and if that be true of dentists, who have sat through large foil operations, how about our patients whose discrimination, in favor of foil, enters only after it has proven its case after many years of service?

A kindlier technic is surely indicated. The cause of foil cannot be permitted to rest merely on the merits of the filling itself. We have all known of very capable operators who, in creating masterpieces, were grossly unmindful of the "on high" thus doubling the blow and, even though his output was exceedingly meritorious, he never advanced the cause of the Bonwill with the public or the profession. Another operator has been so indiscriminative as to use but one plugging point, a short, straight, stocky, relentless foot point, for all operations for the last twenty years. He even points with pride to the fact that it has been removed only when worn out. Instances like these incline one to anger.

Complete reply to a most natural ques-


the surface of the
three COVER GLASSES
on the next slide was
done with a normal blow
of the Bonwill — with a
diamond point.
It illustrates the absolute
and delicate mastery of

1A



1B

Figs. 1A and 1B.—Writing chiseled into the surface of miscroscope cover glasses with a diamond as a plugging point in a Bonwill mallet, a feat impossible with any other condensing method.

patient, quite as if the tooth were held by the vice in a carpenter's bench. In all candor I am none too confident but that during a period of my practice, actuated by the natural desire to increasing my output, I have not been entirely free of criticism, but this paper is prepared in the cause of worthy easements to both the patient and operator and my mind is open.

The Bonwill, with some operators, has been, too often, open to censure. I know, as an instance, of one exceedingly clever Bonwill operator who not only set the mallet to produce an abnormal blow but in addition, continuously ran his engine

tion as to the apparent failure of popularity on the part of the Bonwill, especially in view of the claims that I advance, opens a phase of the subject that could consume the entire time allotted today.

It is a grievous story. One that was replete with disappointments to Dr. Bonwill who, in my estimation, is easily the most versatile genius in the long list of inventors in the history of our profession. The mallet was born before its logical day. It was placed before the profession fully fifteen years before the advent of the electric cord engines upon which all claims for ease and efficiency

depend. On a foot engine it was a man killer, especially if pedaled by the operator.

The story of the hazards and deterrents in detail is as follows:

1. The Bonwill mallet was, has always been and is, fundamentally, a cord engine instrument but when placed on the market by Dr. Bonwill about thirty-five years ago the cable engine outnumbered the cord type ten to one. I will designate that as hurdle number one.

2. This, very naturally, led Dr. Bonwill to issue a second type of the mallet that was operated *in the end* of the handpieces thus creating a monstrous combination of cable, handpiece and mallet, the hand weight of which was twelve ounces—hurdle number two (Fig. 2).

3. During this time Dr. Bonwill endeavored to market his inventions and practice dentistry at the same time with the usual results so commonly known. His remarkable personality and brilliant versatility had a dominating note that was very easily misunderstood and I am fairly confident that it held against him and his inventions. This I will designate as hurdle number three.

4. Electric engines were not only unknown at that time but the employment of trained assistants in dental offices were very uncommon indeed. In other words the dental profession very naturally did not take kindly to the double duty of pedaling the engine and managing the mallet at the same time—hurdle number four.

(Parenthetically I may explain my sustained interest in the mallet by stating that, more largely through accident than good management, I have had an assistant from the very first day of my practice, or to be more definite, to state that neither the cord foot engine of my early years, or the controller of later engines have been on my side of the operating chair more than forty hours in thirty years.)

5. When the inventions of Dr. Bonwill came into the control of a dental manufacturing house, the mallet was refined in very many respects and many very valuable changes were made which I will not recount but, quite as if fate never intended that the mallet should come into its own, the effort previously made to adapt it to the cable foot engine was not only continued but the plugging points devised by Dr. Bonwill went into the discard, if I am correctly advised.

Under a misconception, very probably without proper counsel, they were completely replaced by the issuance of long cone-socket handles which permitted and in effect suggested the adoption of small points that I will class as impossible. It is to this unwise option and to the impossibility of gaining Bonwill points that I trace the edict that the Bonwill "pulverizes margins". In fact, there are, in my opinion, not more than one or two in the entire list of cone socket points that are even similar to the Bonwill points.

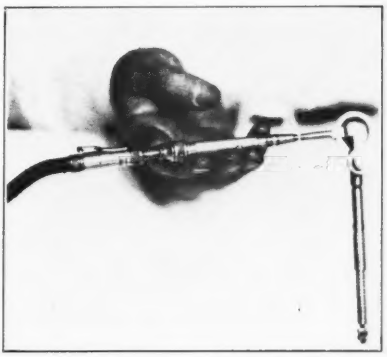


Fig. 2.—The weight of this monstrous combination is three-quarters of a pound.

I am so confident that this was quite the most serious misadventure in the entire list that only recently, and with great effort have I succeeded in establishing some of Dr. Bonwill's points with

the manufacturers (Fig. 4). Furthermore in common justice, it is my belief that the mallet will again bear the name of Bonwill.

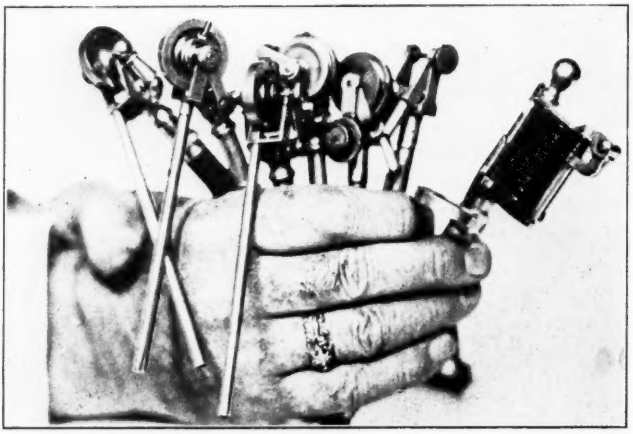


Fig. 3.—Writer's experience with power methods.

Recurring once more to the special plugging points I wish to make it very plain that they are indeed absolutely necessary to the complete enjoyment of the

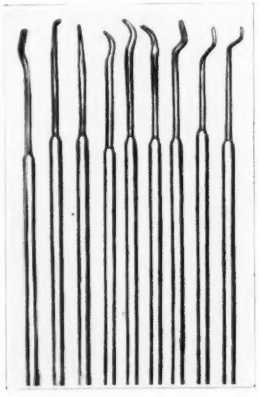


Fig. 4.—Set of nine points (after Bonwill) recently registered for manufacture with the S. S. White Dental Manufacturing Company.

advantages of the method and in closing that phase of the subject it is again my belief that all adverse criticisms, it matters not with whom they rest, surely must be based on a very slight experience with one of the earlier forms of the instrument—minus the Bonwill points. Surely not with the exceedingly refined and clever instrument now issued as the S. S. White engine mallet No. 3A (Fig. 5).

I have spoken, thus far, mainly of large operations because they seem to best illustrate the claims that I have advanced regarding the omission of the rubber-dam but as I have "comparative pastime" in my title, which implies a plea in favor of the patient, I am not uncompromisingly insisting on a return to foil in that fairly numerous class of cavities which may be considered logical inlay propositions.

I have included a plea for kindlier operations and as I have also said, in that connection, that my mind is open and I am quite at ease, therefore, in admitting that an M.O.D. in my own mouth would go into the hands of a clever inlay operator.

That which is sought is a logical rein-

statement of foil in a very considerable class of medium and small cavities that, in increasing numbers, will go some other route if foil is permitted to become a lost art. And as we shall succeed only in the degree that foil becomes popularized it becomes a question of how and when.

Just a word in the staccato. The dental profession has slipped and is still slipping in the matter of foil. Commercialism is the present rampant on our shield. Innocent fissures and hair line fissures are daily being ruthlessly spoliated and many legitimate foil cavities are being vicariously dealt with all because, I regret to say, of a decadence in the use of foil.

It is true that the schools still teach foil and state boards require a showing of skill but students have coined the expression "board fillings" that has become a part of their daily jargon, revealing, unmistakably, that the interest of the student is largely, if not solely, that of "getting by the board". Of this I am certain. Foil, and by foil I also mean cylinders, will not come back unless it is made easier to the patient, easier to the operator and easier to the assistant. All hope of reinstatement rests squarely on that point. The divorce has been too great and the voice of the public too insistent to permit us to believe otherwise and as we shall succeed only in the degree that foil operations become popularized the question of the hour, as stated, is that of how and where.

Being in no way connected with a dental school I am singularly free, on the subject of hurdles, to make brief allusion to the fact very few colleges—almost none until very recent years—were so equipped, electrically, as to provide students with a full opportunity to know the Bonwill.

The foregoing terse recital of the difficulties in the path of the Bonwill are offered in explanation of its failure of widespread popularity. But as now issued it is an exceedingly clever instrument that fails in no respect whatever to perfectly meet all requirements and with electric cord engines on every hand, its adoption should spread.

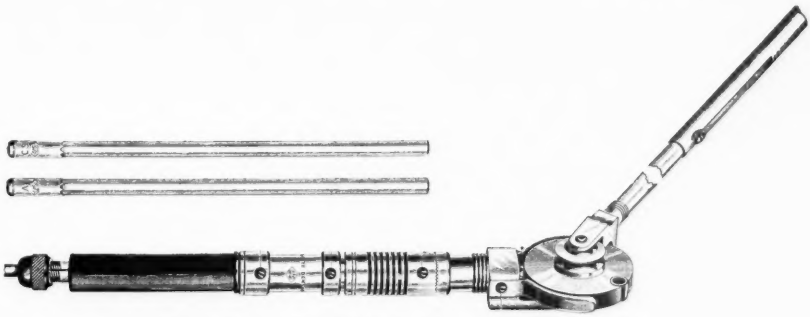


Fig. 5.—Latest Bonwill (S. S. W. engine mallet No. 3A).

My compliments and best wishes to all clever gold operators with whatever method. The Bonwill is easy. It requires less energy, less time and, I may as well admit it, far less skill.

Do not misconstrue this to be a disingenious felicitation or peroration. It is the truth! *The Bonwill requires less skill.*

Discussion

C. N. Johnson, Chicago, Illinois: It is a distinct honor, and I feel it such, to be permitted to open the discussion on any paper presented by my good friend, Dr. Southwell. Everything he says before an audience or in private conversation is entitled to the greatest

respect. I have seen his operations and I know whereof I speak.

If there are any who have not seen his work I would suggest to them that they take the first opportunity of doing so, and they will see a revelation in gold foil work that I believe will astonish them.

The question always arises, in the discussion of these subjects, as to whether a certain process may or may not be followed with equal success by all operators. I think we must admit that it cannot. Dr. Southwell is able to accomplish everything that has been intimated in his paper and he is able to accomplish it with ease to himself and to his patient.

He has given us a very ingenious method of maintaining dryness. I have never seen that demonstrated, but I am willing to accept any statement that Dr. Southwell makes in regard to the efficiency of this or any other process.

A question would arise naturally as to what possible effect that kind of a current of oxygen might have upon the tissues when maintained for any length of time. But we have Dr. Southwell's assurance that it has no deleterious effect whatever. With that assurance in mind, I think we may all very safely give it a test.

There is no question but what in the past one of the great prejudices against the use of gold foil has been the fact that it has been necessary in these large restorations to use the rubber-dam. And the rubber-dam has introduced among our patients as much prejudice against dental operations as any other one thing, as much prejudice probably as the pain that we give them. Great complaint has been made always by patients of the use of the rubber-dam. If there is any process by which we may escape its use, I should look upon it as a distinct advance in operative dentistry.

Dr. Southwell is right when he says that we need a kindlier technic in the insertion of foil fillings. We need a kindlier technic in the use of any process in dentistry. If we are going to get a kindlier technic for our patient, we have to get a kindlier technic right in our hearts. I have been interested in hearing men describe processes, and have been impressed so frequently that there is one factor in the operation too often overlooked, and that is the patient. We may theorize about the perfection of this or that technic, but unless we have before us vividly all the time the point of view and the picture of the patient, we are not proceeding along correct lines.

I remember taking to task one of my good friends in the profession who was a brilliant gold operator. I said: "Doctor, you are developing too frequently a dread of dental operations." He said: "I have to hurt to do the work right." "Yes," I said, "but when you are trying to do the work right, you must also remember the patient." He said: "Doctor, I confess I sometimes forget I am working on a human being." With all a man's brilliance, he who forgets he is operating upon a human being has no business to be a dentist or surgeon or medical man. That should be taken into consideration always. If not, the practitioner has not the heart of a true professional man.

Just a little digression for which I make no apology for introducing at this time. Dr. Southwell said a very significant thing when he spoke of his assistant. He has been fortunate in his assistant, and I congratulate him and the assistant as well. We do not frequently enough, in our deliberations before these organizations, magnify the importance of the assistant. I want to pay my tribute to the young lady assistant in the dental office. Some time I am going to write a paper on the dental assistant. If we stop to analyze the progress that operative dentistry has made, we will be compelled to admit that the young lady assistant has been one of the chief factors in that development. And I would like to pay a tribute to her before I die that will make her live in the history of the profession in the niche, as nearly as I can place her, where she justly belongs.

Dr. Southwell lamented the fact that foil might become a lost art. I deplore any movement, any development, anything which would make that thing possible. Foil has done too much for the preservation of the teeth of the human race, and is capable of doing too much in the future, to ever let us admit into our consciousness the possibility of the manipulation of gold foil becoming a lost art. It is just as capable of doing good in the future as in the past.

I wish to also agree that the use of inlays in pits and fissures, such as he described is not the best kind of practice. I do not want to go into the technic here either of gold foil or the gold inlay. The dentists who have been in the chair as patients know that pits and fissures or cavities of that type can be filled in less time and to greater perfection with gold foil than with the gold inlay. There is one thing, however, that we must always bear in mind, that this question can not be settled in all its details merely from the point of view of the dentist himself or of the technic. There is the point of view of the patient that I referred to a moment ago. We must bear that in mind also. I imagine there are very many of our patients whom we could not persuade, even if we wanted to, to go back to the large restorations of gold foil that we formerly made when they have had the experience of having those same cavities filled with inlays in a manner much more comfortable to them and, so far as they know up to date, with just as good service. I have made the statement repeatedly and I want to make it again, that I do not believe there was ever

devised in the alchemy of nature anything which will so surely save a decayed tooth against loss in the way of filling as a well inserted, well condensed, well adapted and well finished gold foil filling. Please remember that I did not say a perfectly condensed, a perfectly adapted nor a perfectly finished gold foil filling. I said well condensed.

I would like to say just a word in the discussion on the terms "perfection" and "ideal". When that word "perfection" was used, I was inclined to side in with my good friends Drs. Thornton and Price. I do not believe we ever attain perfection in any of our operations. The attempt to attain perfection is laudable and praiseworthy, and the more we attempt perfection the better we are doing. But we never attain perfection. Somebody qualified it by saying we attain the ideal. We do not attain the ideal. And when that realization was forced upon me that we could not attain the ideal, it was the greatest personal defeat I have ever suffered.

What we look upon today as the ideal may not be the thing we look upon as the ideal tomorrow. Because if it were true, that ideals did not change, the world would stand still. The thing that seems ideal today and which we may attain tomorrow only leads us on to a higher achievement when we see something more ideal on that tomorrow. What we may class as perfection in our operations today, on account of the development which we hope will come in the dental profession, will not be deemed perfection tomorrow. If there were such a thing as attaining perfection, when we got there, we would stop still. There is no such thing as stopping still in this world or in this profession.

When it comes to the selection of different methods, whether the inlay or gold foil, I have only this to say—one process will appeal to one individual and another to another. That is the human equation in it. You can't practice dentistry without considering the human equation. You should select a method by which you can best serve the people.

I will repeat what I have said before. I believe, in the practice of dentistry, we have today need under different conditions and different indications for all the different fillings ever advocated. We have need of the oxyphosphate of zinc, of the silicates, of guttapercha, of amalgam, of tin and gold; and we have an indication today for the use of the gold foil filling. Let us have sufficient breadth of vision to take each case as it comes to us, not according to a routine rule, doing the thing tomorrow which we did today, but studying each case from its individual requirements and using that method and doing that thing which is to be the best for that patient as we see it at that time.

Charles E. Woodbury, Council Bluffs, Iowa: I sincerely hope that nothing that I may say in this discussion will in any way influence anyone who is becoming interested in the manipulation of gold foil to become discouraged or to think that there is any great difference of opinion as regards the methods used by different operators. In the hands of competent operators and where its use is indicated we never have had any material or method that compared favorably with gold foil as a means of restoring lost tooth substance. And mind you I am not discrediting the use of the gold inlay, amalgam or synthetic porcelain. All of these materials should have their places among our methods of procedure.

The essayist's use of oxygen as a dehydrating agent is very interesting, and being ignorant of its merits, it is not for me to commend or to condemn. I hope that the experience of the average operators will fully justify the high hopes that Dr. Southwell places in its use. I also wish to defend the use of the rubber-dam and to affirm that under correct manipulation its use is neither unpleasant nor painful, except in those cases where the decay goes to the periodontal membrane. It is certainly a positive barrier to moisture and any method that is used in its place which is not equally positive assumes an unjustifiable risk. It seems to me that the correct and comfortable application of the rubber-dam is almost as much of a lost art as the manipulation of gold foil and incalculable damage to the investing tissues of the teeth may be done by its careless or rough application.

I am rather familiar with the use of an engine mallet, having used an S. S. White mallet on a cord engine for three or four years and I can not state my experience and views any better than to quote from Vol. 2, pages 251 and 252, of G. V. Black's "Operative Dentistry".

"Of the different plans of applying mallet force, the hand mallet used by an assistant is by far the best, as it will produce the desired result with the least wear and tear to both the patient and the operator. The next best, but much inferior, method is by the use of the automatic mallet. Of these instruments there is a variety in the market of almost equal merit. The poorest method practiced is the use of the hand mallet by the operator himself. In this use of the mallet, the operator can handle neither the plugger nor the mallet properly, and the usual result is great wear and tear upon both the patient and operator, and generally much imperfect work in condensing the gold, especially in its adaptation to margins. In order to condense gold well and with the least pain to the patient, the mallet force should be combined with a certain degree of hand pressure. The plugger

should be placed firmly in position with such force as to bring the looser portions of gold well together and to force the tooth into stable position in which the fibers of the periodontal membrane are rendered tense, and then the blow from the mallet should follow on the instant this is done, two blows following each other in close succession. Experience has, I think, sufficiently shown that the best results are obtained by this method. This is in some degree copied with the automatic mallet. The sliding of the plugger point over the surface of the gold while blows are being rapidly applied, is very much more painful to the patient if the same results in condensation are accomplished. A number of machines have been devised for malleting that are very convenient in use, and yet they seem not to be much used, evidently for the reasons assigned. Among these are included the electric mallet and several mechanical devices attached to the dental engine. It is perfectly practicable, however, to make good gold fillings by any one of these plans of using mallet force. The main questions here are as to ease and rapidity of manipulation in the first instance, and, in the second, as to comparative ease of obtaining good results. In many fillings, hand pressure should be used in the condensation of some particular parts to which mallet force is inapplicable. Mallet force can be applied successfully only in a direct line with the shaft of the instrument. In all cases in which it becomes necessary to apply force in lateral directions to the shaft of the instrument, hand pressure must be used, unless reverse motion with reverse pluggers can be substituted. This can be done in the more difficult position in lower molars and bicuspids by judicious study of the capability of reverse pluggers. The filling of the incisor cavities requires almost uniformly the use of hand pressure. The manner in which we now prepare cavities for filling reduces the necessity for use of hand pressure more than ever before, because of the very free access obtained. Convenience in placing the filling material should always be held strictly in mind in the preparation of a cavity."

My experience with the writings of Dr. Black incline me to believe that when he made a definite statement of fact in regard to any subject, he had gone into the matter so deeply that there was no more to be said. The subject was closed. You will notice that he did not condemn the use of rapid action mallets but prefers other means of producing density of gold. The hand mallet we use is made of lead with a sole leather face to give the blow a slower percussion and power of deeper condensation. The difference in the quality of the blow of the hand mallet and the engine mallet might be likened to the explosion of black powder and nitroglycerin. The one can safely be used for blasting out blocks of granite; the other can not. The black powder burns comparatively slowly and allows the block to start before the full force of the explosion comes; the nitroglycerin explodes instantly and rends whatever it is in contact with.

My experience with the engine mallet convinces me that good gold fillings can be made by its use but that thinner pieces of gold must be used than with a hand mallet or automatic mallet, as the rapid blow does not produce the deep consideration through large masses of gold produced by the slower blow of the other instruments. The line of force may be admirably obtained and in the hands of a skilled operator the gold is built very rapidly. The plugger point is held slightly away from the filling so that the gold receives the end of the stroke. My patients tell me that they prefer the hand mallet, that it is less painful and less nerve racking and just as speedy.

I think that the essayist would have done better to have omitted the paragraph in which he describes shearing the gold between the plugger and the cavity margin. The two blades of a shear or the knife on the pie tin come in actual contact to produce the shearing effect. I can not conceive of a blow sufficiently hard to condense gold being brought in actual contact with an enamel margin, no matter how carefully beveled, without disastrous results. It is possible that the essayist with his wonderful technic can do it but I do not believe that it is a safe thing to teach. Some years ago E. K. Wedelstaedt was in my office and I was making an operation under his supervision. I came to a certain step where I used a method of procedure not commonly accepted. I asked him to withhold judgment until the operation was completed. His final judgment was: "That is all right in your hands but don't you ever show it," and I never have. I can believe that Dr. Southwell's method is safe in his hands but I can not think that it is safe to teach.

E. T. Darby, Philadelphia, Pennsylvania: It seems to me that both Dr. Johnson and Dr. Woodbury have agreed that it is possible for Dr. Southwell to do operations of a superior character with the Bonwill mallet. Now, it cannot be that he possesses all of the skill in the dental profession; others have the ability to accomplish exactly what he has accomplished.

I would say, first of all, that in my judgment the day for foil fillings has not passed—it still has an important place in dental practice. I think the dental profession has been led astray by easier methods of filling teeth. It is natural to take the course of least resistance, and the tendency is to do so. Men have found that they can fill teeth easier and with less manip-

ulative skill by using the plastics. It is true that some of the silicate cements have their place in practice.

Where gold can be concealed from view in the smaller cavities, even in the anterior teeth, and in all small cavities in the bicuspids and molars—in all fissures and pits of moderate size, I do not think there is or ever has been anything equal to gold foil. It has been a sorrow to me to know that the dental profession is drifting away from that method of filling teeth.

And now, in regard to the various mallets: As early as 1838 E. Merritt, of Pittsburg, suggested the use of the hand mallet for condensing the final pieces of gold on the surface of the filling. The profession of that day, denounced it as an unsafe procedure, claiming that it would split the tooth, and also devitalize the pulp. In 1861 W. H. Atkinson advocated packing each piece of gold, from start to finish, with a hand mallet, and in 1863 brought out a set of thirty-six plugging instruments, to be used in conjunction with the hand mallet. I soon obtained a set of these, and in my laboratory, upon the lathe, turned a mallet head from a whale's tooth. From that day I have used a mallet of some kind for packing gold. As there was no rubber-dam for dentists' use in that day, and as the dentist must hold his napkin with the left hand, an assistant was necessary to use the mallet. Hence, the need of an automatic mallet to take the place of the assistant. In 1866 Snow and Lewis, of Buffalo, introduced their automatic mallet, which was soon followed by the Salmon, the Foote, the Abbott, all of which were spring instruments. In 1871 W. G. A. Bonwill brought out his electro-magnetic mallet, which was a purely automatic instrument. As there was no street current in that day, a Bunsen battery was employed to furnish the electricity. This was a most ingenious instrument, and was used by quite a large number of dentists, and with great satisfaction, but being somewhat complicated, it required to be carefully adjusted, and in the hands of some was not satisfactory. A year or two later, when Dr. Bonwill was experimenting with a stencil pen, he discovered that he had invented a mechanical mallet for packing gold in teeth. The first one was made in my work-shop. It was then used on the foot engine, as electric motors for driving the engine had not yet been employed. Finding that the mechanical mallet was equally as effective in packing gold, as the electro-magnetic had been, I adopted it almost immediately, and have used it since with great satisfaction. I look upon it as one of the most useful in my cabinet, and should feel that I could not comfortably insert fillings of any considerable size without it. You will recognize that Dr. Southwell has used it successfully, and what he can do, you can learn to do. The instrument as now made by the S. S. White Dental Mfg. Co. is a most perfect tool and I feel confident, if you will persevere in its use for just a little while, you will look upon it with as great favor as others who would not part with it under any consideration. I have learned that my patients much prefer it to the hand mallet, or the automatic. As to Dr. Southwell's method of using oxygen and compressed air for excluding moisture, and thereby avoiding the rubber-dam I cannot speak intelligently, as I have never seen it used. I have been blessing Dr. Barnum since 1865 for having suggested the use of rubber-dam. To me the application of it has never been a bugbear, and the fact that I can be sure of absolute dryness in my gold operations, has been a great comfort through these many years.

As to the relative merits of the small gold filling and the cast inlay, I prefer the foil filling. We know that the latter have saved teeth for fifty or sixty years. Nothing else has done as well.

Dr. Southwell (closing): Flattering reference has been freely made to my skill with foil but be that as it may I wish to very plainly state that it is quite the easiest feature of my work and therefore not entitled to especial mention. I have always contended that foil, with the Bonwill and the Bonwill points, is indeed very easily condensed in the average accessible cavity.

I remember well the fourth foil filling that I attempted. It was during my college course and an M.O.D. in the upper right second bicuspid. The walls were frail and as I was grinding down the cusps with the intention of building the gold over the cusps I was interrupted by a demonstrator who, while admitting that it could be done, quite as plainly informed me that I could not do it. The point of this personal allusion may be its excuse, namely: that it seemed so palpably easy of accomplishment that, even as a student, I was angered.

In practice I find foil to be so inexacting, especially with large restorations, that I am permitted to re-live my golf of yesterday or my canoe trip of last year (Fig. 6).

The technic of foil has been fearfully overloaded with theory and as an instance let me speak of the three foot points with curved shanks which I advocate for approximal restorations. They have been questioned in the discussion and I confess that I am rather at a loss to understand how an experienced operator can fail to note their advantages unless it be the rather mystifying theories of the order of "milliameter" and "stepping" dealt with so extendedly in our text books. It is possible to use these foot points in the Bonwill quite as well as a straight point (providing the

shank is stiff enough) for the control with the Bonwill is absolutely there at all times.

Mention was made of the hand mallet and the Bonwill in connection with nitroglycerin and black powder and I am wondering if Dr. Woodbury meant to imply that the hand mallet represented nitroglycerin. I confess that I did not quite catch the point.

As to the Bonwill not being easily taught I will again use a personal reference that seems to bear directly on that point. After a young lady assistant had been in my office for six years I insisted that she could fill an M.O. in a molar in my lower jaw. Without assistance she applied the rubber-dam; prepared the cavity and condensed the gold with the Bonwill. This was her first filling. It was done fully twenty years ago and is still doing service. I do not know of a better answer to the question.

Again let me say that I do not know of any feature in operative dentistry that is more overweighted with theory than foil operations. If in my office I had three chairs and three assistants I would be quite willing, with an M.O. in each chair, to begin with number one—fill the first third and then take up with number two and three in turn—doing the same with each. Then to return to number one, two and three taking each in turn for a similar portion until all were completed. And all without the rubber-dam but with the oxygen and three skilled assistants. In this I am endeavoring to tell you how easy and pleasurable foil has become.

Dr. Black's work on Operative Dentistry contains adverse mention of the rapid mallets and while this reply may appear sacrilegious I am very confident that he wrote from a lack of knowledge of the later models of the Bonwill when operated on a cord engine. This combination, plus the points that closely follow the originals of Dr. Bonwill, represents perfection in the condensing of foil. If it is the wish of any one to disprove the qualifications that I allege to be true of the Bonwill or that any other method, in any respect, is superior to the Bonwill I should be very glad to back the Bonwill for almost any sum.

I confess that I have been disturbed over the seeming disinclination or unwillingness of devotees of other methods, in times past, to weigh or give heed to the Bonwill—quite as if they feared conversion.

Answering the question of the relative speed with the Bonwill I will reply that the gold in the average M.O. or D.O. may in one's practice be condensed in twenty-five to forty minutes.

In reply to Dr. Woodbury's criticism of the shearing of marginal excess I call attention to the indisputable fact that the blades of scissors when cutting cannot possibly be in contact. In other words the "goods" (gold in this instance) is between the plugger and the enamel margin. As this shearing cannot be considered a privilege going with the hand mallet, especially with the small and comparatively straight points, it may not promptly come within the conception of the devotees of that method. This question of shearing is indeed the very quintessence or incarnation of control of the plugging point and one that reduces this important privilege to one of great simplicity. I appreciate the opportunity of emphasizing all that I have said and implied. The cinema clearly shows that pure gold rolled plate, twice the thickness of gold backing, may be repeatedly sheared over the same enamel margins without injury thereto. That should suffice.

Fig. 6.—Showing how the foot point with a curved shank reaches the cervical margin.

In reply to his "deep condensation" I have frequently demonstrated (in open areas) that one hundred thicknesses of No. 4 foil may be as thoroughly and rapidly condensed, with a *normal* blow of the Bonwill, as any of the lighter foldings of foil.

Perfectly dry compressed air is quite as efficient as oxygen in ordinary cavities.

My object in preparing this paper was to give impetus to the re-birth of foil, confident in the feeling that, not only had the psychological time arrived for its revival, but also strong in the belief that all conservative practitioners would join in support of a brief in the name of the countless number of medium and small cavities that, latterly, as you well know, are being rather vicariously dealt with.

At no time in my presentation of the Bonwill, whether in my paper or the cinema or the slides, have I referred to any other method or means other than in the glass tube experiment or "study" of the excursion of the blow or

force of four methods. In this I aimed to be exceedingly careful. At one point it is offered as a study and at another it is discounted as not being a finality.

My paper was an offering without argument or rhetoric. Just a plain submission of truths regarding the possibilities of the Bonwill that have culminated in an experience of over thirty-five years, beginning with the electric mallet.

In this I trust that I have made clear the distressing impediments in the pathway of the Bonwill. It was frustrated and baffled on all sides. A wide adoption on a foot engine was not only impossible but it also found the field signed and sealed over to other methods that were firmly established not only with the profession but in the schools. I need say nothing more as to the absence of electricity at the chair side in the infirmaries in the years gone by nor of the dependence of the Bonwill on an electrically driven engine but I feel that I may call attention to the fact that owing to the low cost of the hand mallet and the automatic—both simple and easily contained in the student's instrument case—they most naturally found favor with students, who very naturally, continued their use on entering practice.

While I believe that I have succeeded in avoiding mention of or comparison with other methods; yet, like the item for a new overcoat in the traveling man's expense account, it is obviously there just the same. And why not?

I do not enjoy the feeling that, as between mature minds, one need hesitate in being partisan, especially if well grounded. Convictions move the world and are useless unless used. We were born to differ and if it will be taken in the spirit offered I will, by reversing *the whole question of methods*, place the subject before you in what I believe to be a new and not illogical light.

I will first ask you to forget that gold, as a filling material, had ever been known and that cavities in teeth had been cared for otherwise.

I will next ask you to fancy that the cohesiveness of foil and the Bonwill Mechanical Mallet on an electrically driven engine came to our attention at one and the same time and that the Bonwill, equipped as stated above, was the first method known or practiced. In other words, that we were then occupied and well grounded in the use of cohesive foil and cylinders, the electric cord engine and the latest type of the Bonwill Mallet. To carry this rapidly to a conclusion we will fancy that the other methods were next conceived and on the right hand and on the left, earnest, capable, gentlemen were demanding attention for some one of the other methods.

Now please bear with me. I yield first place to no man in my respect for the attainments of many noted operators and teachers of methods that are still at variance with that which I advocate. I compliment them wherein I seem to question but it is as truly and as earnestly my belief that the other methods, under the circumstances outlined, would receive but moderate attention and the claimant gain nothing more than a tolerant bearing.

Another illustration: We will presume that the writing of letters began with the typewriter and that later the quill pen, the steel pen and even the fountain pen were brought forward and for either or all a claim was made for some degree of equality or superiority. What would be the answer? What would be the output per diem or the character of the writing or the condition of the writer at the end of a full day?

Another illustration: I have it from an authority that the making of a suit of clothes requires forty-three thousand stitches and that not more than twenty per cent are necessarily done with the hand needle.

What would be the reply if manufacturers were pleaded with to confine themselves to the hand needle or even to the early styles of sewing machines that were operated first by hand and next by foot?

I hardly need remind you of the fact that riveting, caulking and carving of the finest figures in marble are done with pneumatic tools.

There is no question but that perfect foil operations, or perfect letters like those of C. N. Johnson, or high class garments or carvings may be accomplished by other means but it is my belief that ease, speed, accuracy, solidity, time, strength and enjoyment of one's work while at the chair and the enjoyment of life after office hours, are factors to be reckoned with and to be found in greatest number and completeness in the Bonwill.

All that one needs to *know* is the Bonwill.

RADIUM THERAPY IN PERIAPICAL INFECTIONS[1]

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THIS paper supplements a preliminary communication published earlier in the year (1). The original conclusions made therein have been confirmed, namely, that solutions of the products of radium emanation possess distinct bactericidal properties and are useful in the treatment of periapical infections. Additional data are presented but the analysis of them clearly indicates that with the present day knowledge it is impossible to state definitely and conclusively why the emanations produce such characteristic effects. This report should therefore be considered merely as a statement of progress. However, it may be advisable in this connection to summarize briefly the theoretical considerations which justify the application of radium in the treatment of dental infections.

A review of the literature dealing with radium shows that its bactericidal action has been described by a number of workers, although nothing definite is published with regard to the clinical application of this property. As early as 1909, Iridell and Minett (2) observed that radium exerts an inhibitory influence on pathogenic and non-pathogenic organisms. Ten years later Lequeux and Chrome (3) confirmed this in their report upon the action of radium on bacteria. In their experiments they exposed different organisms to radium emanation for varying periods of time. The emanation exerted a noticeable inhibitory effect upon the growth of cultures of streptococcus.

In 1919 the author received a supply of ampules containing radium chloride and sodium hexavanadate. He sought to determine the efficacy of this solution in the treatment of gingival and periapical lesions. The reagent was packed in sterile glass ampules containing "2 micrograms of radium element as chloride and 50 milligrams of V205 in the form of sodium hexavanadate in 2 ccs. of sterile normal physiological salt solution." Although the results of a preliminary series of tests conducted in the dental clinic of the University of California were disappointing, they suggested the possibility of using other radium preparations in the treatment of periapical infections.

The evident success which has attended the radium therapy of skin lesions induced the writer to devise a modification of the present method of application which would make possible the study of the action produced by this agent on acute and chronic dental apical abscesses. Observation of clinical cases, extending over two years, has shown that lesions of this type readily yield to the new method of treatment, and up to the present time no untoward effects following the use of radium have been observed.

[1]From the Radium Laboratories of the University of California Hospital; The Laboratories of the George Williams Hooper Foundation for Medical Research, and the College of Dentistry, University of California. Aided by grants from the American Dental Association, and from the Board of Research, University of California.

Through the courtesy of Dr. Howard Morrow, Dr. Laurence Taussig, and Mr. L. B. Clark, it has been possible for the author to secure capillary tubes containing radium emanation. These tubes had been used in the skin clinic and eye clinic for various purposes until the "de-emanation" had proceeded to such an extent that further application for this work was purposeless. Although the degree of radiation is recorded in the tables in terms of millicuries, the measurement of the beta radiation from radium D and E has not been made.[2]

Radium emanation or niton is a *gas*, the disintegration products of which are *solids*. It is a solution of these solids which is being employed. Tubes containing the emanation are customarily measured in terms of gamma radiation. As each preparation grows older it suffers a slow decomposition so that the hard gamma rays grow less each day, until they finally become an immeasurable quantity. At this time the conversion of the radio active substance to its next lower disintegration product has been partly completed.[2] These newer products, principally radium D and E, give off what is termed the beta rays. Since the gamma radiation has become practically nil, the effects produced are in all probability due to the influence of the beta ray. It may be recalled that Tarnowsky (4) quotes Hektoen to the effect that radium "emanation" in hibits phagocytosis and hence lowers the natural resistance of the affected part; but in these experiments there has been employed, as already stated, a preponderance of the beta rays.

Method of Applying the Products of Radium Emanation to the Diseased Tooth

It has been found practical to apply the radium in the form of a solution. The latter is prepared as follows: A radium tube is placed in a sterilized mortar of about 20 cc. capacity, covered with Ringer's solution, and then crushed with a pestle. On account of the rapidity with which the radio-activity of this solution diminishes, it is advisable to crush the tubes immediately before use.

The radio-active liquid is carried to the pulp canals of the tooth by means of sterilized cotton points. These points are sealed in the canals for a period of from one to four days. Subsequently the dressing is removed, the pulp canals tested for sterility, and finally filled.

The sterility tests of the root-canals are conducted in the following manner. The tooth is opened under the sterilized rubber-dam and the crown and adjacent areas flooded with alcohol, thoroughly painted with a one per cent solution of crystal violet—brilliant green, and dried with hot air. The cavity is exposed and the cotton points which originally carried the radium solution are discarded. No attempt is made at this time to desiccate the canal, but the excess moisture is removed by repeated applications of

[2]The term millicurie may need definition. Radium, like other radio active elements, is constantly undergoing disintegration, by breaking up continuously into elements of a lower atomic weight. The *first* disintegration product of radium is radium emanation or niton. The unit which expresses the quantity of niton is called a curie, and this unit represents the amount of niton in equilibrium with one gram of radium. The working unit, however, is one-thousandth of this amount, or a millicurie. The second disintegration derivative of radium is radium A. The third, radium, B, and so on until polonium, and finally presumably lead is obtained. The life of these many decomposition products covers a wide range, and varies in fact from a few seconds to a number of years. The small capillary tubes which are being used contain radium emanation, together with the elements of lower atomic weight, namely, radium A, B, C and D. These are the substances used in this research. All of the derivatives of radium emanation are in a state of transitory equilibrium with one another. That is, they are continually decomposing into their next lower disintegration products. Since radium D is derived from previous short time substances, and since its period of disintegration is longer, it is evident that it exists in preponderance in the tube. In addition to radium D, there are presumably minute quantities of radium E and F (or polonium).

fresh sterile cotton points. Following this another point is placed in the canal and sealed under both base plate gutta-percha and crown and bridge cement. The gutta-percha is used in the pulp chamber for the reason that it may be sterilized by dry heat immediately before it is placed in the cavity. This filling of itself is not sufficient, for it may be recalled that under the stress of mastication, the gutta-percha tends to pull away from the walls of the cavity and thus permit reinfection from the flora of the buccal cavity. This discrepancy is overcome however by supplementing the partial filling by one of crown and bridge cement. The cotton point is allowed to remain twenty-four hours and then removed in the same aseptic manner in which it was placed. It is dropped immediately in a tube of culture media, consisting of glucose veal infusion sheep's blood broth. This has been found to be particularly favorable for the germination of the organisms usually identified with these lesions. The property of delayed growth of the streptococcus group is of course well known, but in these clinical observations, it has been found practical to incubate from 24 to 96 hours.

With two possible exceptions, there has been no evidence of succeeding soreness or pain. One of the exceptions referred to was one in which the pericementitis resulted more probably from mechanical trauma incident to the previous curetting of the canal than to the action of the radium itself. The amount of solution carried to the tooth averaged 0.05 cc; in which there were approximately 0.0630 millicuries of products of radium emanation.

Experimental Data

For the sake of brevity the correlated data have been presented in tabular form.

Taken in the order in which this information was compiled the primary point of interest is that of dosage. As has already been stated the strength of the various solutions has been measured in millicuries of gamma radiation, and although this serves as a basis of comparison, it does not give an exact indication of the amount of beta ray contained in the different solutions.

A brief synopsis of several case records serves to indicate the variations in the pathology, age of patient, etiology, treatment and clinical result. In this connection, it may be stated that some of the cases are students at this institution and radiographic evidence covering at least four years will be presented in due time.

The variation in dosage is noted in the appended table:

Millicuries of tubes	Millicuries per cc. of solution	Amount placed in tooth
6.0	1.20 per cc.	.060 millicuries
7.9	1.58 per cc.	.079 millicuries
5.5	1.10 per cc.	.055 millicuries
4.6	0.92 per cc.	.046 millicuries
9.1	1.82 per cc.	.091 millicuries
7.5	1.50 per cc.	.075 millicuries
6.3	1.26 per cc.	.063 millicuries
5.3	1.06 per cc.	.053 millicuries
13.8	2.76 per cc.	.138 millicuries

The following synopsis of selected case records will help to describe not only the varied pathological conditions studied, but also the extent of treatment which was occasionally found necessary.

No.	Clinical Condition	Etiology	Treatment	Result
486	Dry gangrene of pulp. Upper left cuspid. Patient aged 20.	Mechanical trauma from fall some years previous.	Radium treatment 2-10-22. Sterile test after 48 hours incubation 2-11.	Canals filled 2-22. Check up O. K. 6-29.
4344	Chronic apical abscess. Upper left central incisor. Age of patient between 40 and 45.	Caries. Previous nine weeks treatment outside of college unsuccessful. Root-canal reamed too large at apex for ideal filling.	Radium treatment 3-2. Sterile test after 24 hours incubation 3-7.	Canal filled 3-11-22. Radiograph showed over filling. Alveolus opened at apex and excess gutta-percha removed. Radiograph shows apparently normal tissue 7-3-22.

No.	Clinical Condition	Etiology	Treatment	Result
5178	Chronic apical abscess. Upper left second bicuspid. Age of patient between 50 and 55.	Caries.	Imperfect root-canal filling removed. Radium 4-13-22. Sterile test after 72 hours incubation 4-15.	Canal filled 4-17-22. Tooth normal 6-30.
953	Chronic abscess with fistula at bifurcation of roots. Lower right first molar. Patient aged 20.	Caries.	Fistula lanced 4-11 Dichloramin T 4-12 Radium 4-13 Radium 4-14 Creosote and viogen in fistula 4-15 Radium 4-20 Sterile test after 48 hours incubation.	Canal filled 4-23.
3963	Chronic apical abscess, drainage thru canal. Upper left central incisor. Patient aged 12.	Trauma in which portion of crown was broken off.	Dichloramin T creosote from 3-28 to 4-20 Radium 4-20 Sterile test after 24 hours incubation 5-6	Canal filled 5-8.
			RESUME	
	Age of patient varies from 12 to 55. Conditions range from acute abscesses to chronic abscesses with and without fistulae.	Infective.	Some cases treated without any other drug having been used. Others have had many previous treatments without success. Canals found to be sterile in 85% of cases.	Canals filled. No teeth have shown adverse clinical symptoms to date.

Discussion

There are certain outstanding features of the treatment which merit additional discussion.

In many instances tubes have been used in which de-emanation had proceeded to such a degree that it was not possible to obtain a reading by the electroscope. These have given similar results in so far as bactericidal action is concerned, but they have not caused the soreness which sometimes accompanies the use of solutions containing a recorded amount of gamma rays.

In general the cases which have been selected have been those in which previous treatments have been without satisfactory result. Dichloramin T, formocresol, beechwood creosote, phenol, and other antiseptics of a similar nature had been used without producing a noticeable change in condition. In fact, the greater majority of the cases carried a history of unsuccessful treatment. Most of these yielded to the action of the radio active solution. It might be argued that the results which were obtained by the radium therapy were not due to this agent, but were due to the previous treatments of other drugs. Such a view hardly coincides with the facts of the case, however, for when the patients were referred to the clinician for further work, they had been classed as hopeless in that other therapeutic agents had failed to produce any observable change in the condition.

Sterile pulp canals have not been obtained in every case, neither have perfect root-canal fillings been placed in each instance, but in spite of this fact, no teeth have been lost as a result of radium therapy. Failures in obtaining sterility of the pulp canal are difficult to trace and almost any number of reasons may be advanced to account for this lack of one hundred per cent efficiency. Other methods of therapy have likewise indicated that a successful operation may not always be expected. But the fact remains that sterile tests have been obtained more often with *this* treatment than in similar experiments with other antiseptic agents.

During the last two years there has accumulated radiographic, as well as clinical evidence to show that healing in

the apical area is progressing to a satisfactory degree. Clinical examination shows a tooth performing its function properly and without discomfort or distress to the patient.

The precautionary measures which are to be observed are naturally those referring to dosage and technic of application. Severe radium burns resulted in monkeys when emanation tubes containing eighteen millicuries were sealed into pulp canals of central incisors. These burns were so extreme that the hard palate and orbit were involved. It is believed to be impracticable to use the radium except as a solution of the solids. The tubes should be thoroughly crushed under Ringer's solution exactly at the moment of use, and it has been customary to have three or four patients prepared and ready at one time in order to secure the greatest economy of material. The limited availability of de-emanated tubes except at emanation laboratories is a serious drawback to an extensive application of this therapy. However it is planned, if funds become available, to further extend these researches to include not only additional data upon dosage, but also to report upon the application of other radio-active preparations which may be found to be more plentfully distributed.

Conclusions

1. A method of preparing a radio-active solution is described.

2. This preparation is useful in the treatment of chronic dental apical abscesses.

3. Sterility of the pulp canal by means of this therapy is obtained in eighty-five per cent of the cases.

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DENTAL FOCAL INFECTIONS AND THEIR TREATMENT

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FOCAL infections always bring to mind that great work of Billings, Rosenow and their co-workers, through whose researches and epoch-making findings attention of the medical and dental world was directed to certain infections as causative factors in the production of various systemic and organic diseases, the treatment of which has become more satisfactory since this recognition obtained and such causes are being removed.

The relation of dental focal infections and arthritis was noted clinically as far back as 1801 by Dr. Benjamin Rush, but definite relationship, so far as specific organisms found in these lesions is concerned, was not established until Billings and Rosenow showed that the streptococcus viridans and the streptococcus hemolyticus, the organisms usually found in those foci, were identical with those found about the arthritic joints. Moreover, Rosenow showed that while some of these strains had an affinity for joints, others had an affinity for heart, others for nerve tissue, others for muscle, others for the appendix, etc. He proved this by animal inoculation. He cultivated the organisms obtained from such infected areas, and by injecting them into guinea-pigs and other animals reproduced very many times the identical systemic diseases from which the patients suffered. However, let me remind you at this time that these focal infections occur, not alone about teeth, but also in the tonsils, the accessory sinuses of the nose, the middle ear, the mastoid, the gastrointestinal, lower respiratory and genitourinary tracts, notably the seminal vessels, Fallopian tubes, bladder, etc. A chronic suppuration in the canal in the recessus medius of the pharyngeal tonsil, known as Thornwaldt's disease, may also be a focus of infection (13).

These foci of infection are often responsible for various systemic disorders of which I will mention but a few. Probably the most common is some form of arthritis or myositis, commonly known as rheumatism. Endocarditis probably comes next in frequency. Iritis also occurs frequently as well as neuritis. Goiter, asthma, nephritis, chorea, and various other disorders are said to be caused at times by the infections under discussion. Furthermore, we are all agreed that in cases in which the systemic disorder, caused by such a focus, has been in existence an appreciable length of time, metastatic depots may have been formed which often prevent a rapid clearing up of the systemic diseases after the original focus has been eradicated.

These discoveries have reacted in various ways upon different individuals and we find that history has repeated itself here as it often has before when a real advance was made; that is the pendulum has swung from one extreme to the other. This is true, both so far as the dental and

the medical professions are concerned and we find that today these professions are divided in their attitude toward this subject into different classes of individuals, holding different views, which only time and more light on the subject can bring together. We may, for the sake of convenience, divide these different attitudes into three groups.

So far as the dental profession is concerned, we find men who are willing to save every tooth which can be made comfortable and which is firm enough to be retained in the jaw. Many of this number, I am sorry to say, are inclined to ridicule the value of the roentgenogram and the information which it imparts to those who have learned to interpret correctly what it shows and evaluate such findings properly. This group forms one extreme. The other extreme consists of those who for any reason, have enlisted under the banner of the so-called "100 per cent vitality club," those who insist that every pulpless tooth or every tooth which is about to become pulpless, is a positive menace and must be removed. They are the men who frequently in the removal of such teeth ruthlessly destroy the external alveolar plate and in the name of "surgical extraction" perform a lateral removal mutilation which so injures the alveolar process that the prosthodontist is unable to make a denture because there is nothing left to which to fit. The third group is represented by men who insist on the extraction of all teeth showing infection at their apices in cases where systemic disease is present, which may be attributable to such focal infection; also of all teeth in healthy individuals so grossly infected that our present-day therapy does not make them safe; they neither hope to do the impossible in the way of saving culpable teeth, nor do they commit themselves to ruthless extraction of a pulpless tooth when clinical evidence and the roentgenogram fails to furnish an adequate cause for its removal.

A similar condition exists in the medical profession. One extreme is represented by men who do not consider teeth to have any material relationship in the etiology or course of these systemic disorders. The other extreme is represented by those who look upon teeth as practically the sole cause of such diseases and order their indiscriminate removal. The third group is represented by men who believe teeth to be one of the most important factors in the direct or indirect causation of those diseases. However, they believe in consultation with the dentist and the use of the roentgenogram as well as the employment of any effective means which will eradicate the infection, if present.

A word with reference to diagnosis. Diagnosis is considered to be fairly easy in these cases and it usually is. However, there are some points which at times tend to confuse. The diagnosis should always be based upon the clinical findings obtained by a thorough examination of the patient's mouth, supported by a good history, and assisted by a proper number of good roentgenograms, which latter the operator should be able to correctly interpret. An accurate interpretation of the roentgenogram, while only an aid in diagnosis, is very important. That such readings cannot be intrusted to commercial laboratories, where men or girls without scientific training presume to tell the operator what pathology these shadow pictures reveal, is obvious. To substantiate my contention, I will cite a few instances, some of which occurred in my own practice, while others came to me indirectly. The mental foramen has often been accused by these gentry of being an area of infection about the root apex of a lower bicuspid. Osteoclasis is a very high sounding title given to this same innocent foramen, also rarefaction of bone,

or cyst, or granuloma. By the same token the maxillary sinus has been labeled as a cyst and in films taken of the maxillary molar region the coronoid process of the mandible has been accused of being an impacted upper third molar where the third molar was missing or a supernumerary tooth where the full complement of molars showed in the picture. Rarefactions have been read into pictures showing normal bone where a comparison of that area with other similar areas in the same jaw, would have revealed the fallacy of the statement; furthermore these so-called rarefied areas gave a clear picture of the Haversian system. The ostium maxillare is sometimes interpreted as an abscess on a molar root. The incisive foramen likewise furnishes at times so-called evidence of infection through the eyes of the inexperienced and ignorant. Impacted teeth, both upper and lower, have been declared to lie externally or lingually to the teeth in the arch by these self-styled experts when clinical examination, by palpation, and often by simple inspection, disclosed their presence on the opposite side to that interpreted from the roentgenogram. The fact is that a single film does not give such information at all. By the same token these people overlook real pathology, such as apical absorptions, etc., and so I might go on citing mistakes, but this should suffice to impress everyone's mind with the necessity of a correct interpretation in all cases. It saves regrets by preventing gross errors in treatment, keeps one from trying to fill attenuated tortuous canals, especially when occurring in roots whose apices are the seat of excementosis as well as from attempting the physically impossible in other directions.

However, we are sometimes confronted with other points in diagnosis, points which have not so much to do with the roentgenogram as with a thorough clinical examination and history.

Such a case presented with a profound toxemia occasioned by an infection located in the left side of the throat. Three physicians pronounced it an infected, impacted lower third molar. Three dentists exonerated that tooth, but found some pathology in the throat, which they said was out of their field and therefore they did not diagnose. A careful clinical examination showed a chronic peritonsillar abscess, verifying the dentists' opinions and disproving the physicians' opinions.

A case of reflex pain, so-called, might be of interest since that may come from impacted as well as from infected teeth. A patient was referred to me suffering with what simulated trifacial neuralgia. Both the patient and the dentist who referred her, were confident that some dental pathology was responsible for her pains. Careful clinical examination and history showed that these pains were due to syphilis, and with antisyphilitic treatment the pains ceased.

Another case, also referred by a dentist, had shooting pains along the side of the face, supplied by the second and third divisions of the fifth nerve. Temporary relief from these pains had been given by irritation of the socket of a recently extracted tooth. The roentgenogram showed no lesion, but the family physician insisted that the pains were due to dental focal infections. No evidence of such foci could be found, but the physician overlooked a pair of badly infected, submerged tonsils, the removal of which gave the patient complete relief.

The question often arises whether a certain suspicious looking area about the root end of a pulpless tooth is infected, or whether it is a lesion in the process of healing or one which has healed by filling in with connective tissue without deposition of calcium salts. Lately an aid has come to my notice, which while new to me may be of value. All I can offer is the statement from the manufacturer. I refer to transillumination of those areas by a suitable high-powered mouth lamp.

The manufacturers claim that infection about pulpless teeth is always shown by a shadow which is easily seen and which does not result from root-canal fillings. They claim that root-canal fillings do not produce shadows, but that the shadow, when produced, is due to the congestion of the periodontal membrane and soft tissues and the local blood changes which accompany such a condition. In this position they are in accord with the teaching of Skillern, who in his textbook on diseases of the accessory sinuses of the nose, makes the statement that the shadow obtained on transillumination of the region of an infected sinus is not due to the pus contained therein, but rather to the congested membrane lining the sinus so affected. I will say, however, that in the light of our present knowledge, I would rather err in a case suffering from systemic disease, possibly caused by a dental focus, by extracting such teeth, than to permit a questionable area to remain, providing that no other foci of infection in other parts of the body can be found, for I hold that it is better for such a patient to lose an innocent tooth or teeth than to chance the loss of his health or his life.

We must always bear in mind (1) that infected teeth, while one of the most frequent, if not the most frequent, cause of some systemic or organic disturbances, are not the only sources in which such foci may occur; (2) that even where no other foci of infection can be found, the eradication of existing dental foci does not always result in a cure of the systemic disturbances. I have already alluded to the brilliant work of Billings, showing the co-existence of focal infections and chronic arthritis, and yet he makes the statement that removal of this infection often, but not always, helps those joints (2). A similar view is taken by other writers. Lawrence (7), for instance, says that the eradication of dental infections may relieve certain constitutional diseases, but holds that as yet it is a theory. He eliminates all oral sepsis which does not sacrifice the efficiency of mastication and calls attention to the fact that anemia and digestive disturbances, which are held to be caused by existing dental foci of infection may just as surely be produced by the loss of the teeth with resulting impairment of mastication as by dental sepsis. He advises the extraction of all infected, useless teeth, but is reluctant in ordering extraction of useful teeth, since good results follow in a small number of cases only. He advises search for other foci as in the tonsils, pharynx, sinuses, pulmonary infections, infections in the digestive, and genitourinary tracts, gallbladder, prostate, etc., and cautions against the sacrifice of useful organs when foci are present, which may be eliminated without such a loss.

Gilmer (4) found dental foci of infection as causative factors in inflammatory diseases of the eye. Rosenow (10) produced iritis in animals by using organisms taken from foci of infection, cultivating and injecting them into those animals. Irons, Brown and Nadler (6) did the same thing with like results. Barker (1) enumerates no less than twenty-eight systemic diseases, which, he says, may have their origin in oral sepsis. Nodine (9) found dental foci of infection to be a very common cause of systemic diseases in his experience at the military hospital, and takes the position that pulpless teeth are most certain, frequent and insidious underminers of health, because: "1. Infections about root ends frequently are symptomless. 2. Foci may be present with roots well filled. 3. Patient is often unconscious of inroads made by such infections because the effects produced are so insidious. 4. Foci are not discovered except by roentgenograms taken accidentally or in course of a thorough examination. 5. Infected root ends may be without symptoms and the infection may not show in the roentgenograms. 6. There is no apparent connection between effects

and infection because the former occur remotely, both in time and place. 7. Most every one above twenty-five years of age, with treated pulpless teeth, has these infections. The older and the more pulpless teeth, the more infections. 8. These foci are most puzzling and require the most skillful efforts on the part of the oral surgeon and the diagnostician in their eradication."

On the other hand, Grove (5) in a paper on this same subject arrives at the following conclusions: "1. Not all pulpless teeth are infected. Hence, they are not all pathogenic. 2. Pulpless teeth with vital tissue in foramina are free from infection. 3. To prevent periapical infection, vital tissue should be left in foramen when pulp is removed. 4. The smallest percentage of infection is found in teeth with fairly well filled root canals. 5. Teeth, radiographically free from infection should not be refilled. 6. Periapical infection often results from the destructive properties of remedies used in root canals."

Davis (3) goes a step farther advocating pulpotomy in cases where a vital pulp must be removed. He says that the pulp may be excised at any place in the canal between the dento-cemental junction and the pulp chamber, providing that the stump left is healthy. And if the operation is done under strict asepsis, the stump will live but no irritating or cauterizing agents must be used and the empty portion of the canal or canals must be filled with a sterile filling without pressure.

Thomas (12) in his "Studies in Protective Cementum Development" reports finding living tissue in the root canals of buried root fragments left in their alveolar sockets for varying lengths of time following attempted extraction. He says that the pulpal tissue was much changed in character from the normal, that it represented a well compacted fibrous mass, with small blood supply, which connected with the soft tissue elements at both ends. He found an area of calcification within the pulpal remains of one of the specimens examined. The surprising thing about the reports of these three authors is that the first two found live tissue in the root ends of teeth only partially filled, and the last author found the same phenomenon in pieces of roots which had been left in the jaw for a greater or lesser length of time after attempted extractions and whose broken surfaces were covered by a layer of cementum. These findings are very much at variance with the accepted teaching according to which pulps when exposed, whether accidentally or through caries, practically always die even with the best treatment, and apical portions remaining after incomplete pulp removal, or pulp fragments contained in root canals of apical ends, broken and left in situ during attempted extraction, are sure to die, and cause infection.

Thomas also expresses surprise at this phenomenon which he couches in the following language: "The persistence of pulp in spite of the shock of the attempted extraction occasions surprise. Its resistence to injury has never been regarded as great, has perhaps been underestimated, and great willingness has been shown to extirpate it upon exposure. Recent researches have shown that pulp fragments persist in spite of such severe abuses as partial removal and partial filling of canals. It has been shown that pulp fragments may function much as do pulps in the terminal stages of secondary dentin formation."

To these views may be added the findings of Skillen, Hatton, and Blayney (11), who in a symposium on "Factors Involved in Root-Canal Therapy" presented three very interesting articles in which Skillen shows permeability of cementum and to a lesser extent between cementum and dentin. Hatton, in taking up the possibility of apical regeneration after root-canal filling, found teeth with root canals not filled to the end, in which the apex contained living pulp tissue in

a constricted canal, the reduction of the lumen having been effected by a deposit of secondary osseous cementum. He says that in a considerable proportion of these teeth, there had been periapical infection previous to treatment and filling which cleared up afterward. Hatton ventures the following statement: "1. Infection of apical regions of teeth containing live pulps or root-canal fillings is a most serious accident, for in the presence of infection, all attempts at regeneration are doomed to failure. 2. Restoration of apical region from end of root filling to apex is a possibility and may not be more susceptible to infection or reinfection than a scar or regenerated tissue elsewhere in the body. 3. Root-canal fillings need not be condemned because all accessory canals and apical portion cannot be reached. 4. It is not wise to assume that the partial filling of root canals is a safe and justifiable routine procedure. The dento-cemental junction at the apex is the ideal termination of a root-canal filling. 5. Regenerations must be greatly hampered by trauma of apical structures, by instrumentation or corrosive drugs. Use rigidly aseptic, gentle, accurate root-canal technic." Blayney emphasizes the importance of accurate case histories, giving age, and general health of patient, nature of pulp exposure if by caries or accidental, condition of periapical tissues as revealed by radiograms taken before treatment is begun, if such histories are to be used as a guide in arriving at a correct judgment as to the success or failure of root-canal therapy. An accurate record of treatments should be kept and results verified by roentgenograms taken at intervals of from three to six months and noted in the history in order to show how successful the treatment has been. He gives a description of the technic of root-canal treatment as practiced in the Dental Infirmary of the University of Illinois, and shows case history blanks used in the college; also exhibiting illustrations showing healing of rarefied areas after treatment.

Recently Dr. J. A. Toren read a paper before the Chicago Odontological Society to which I want to call attention, for in it he claims to be able to determine by blood examination whether a patient suffers from oral sepsis or not. He finds a blood picture unlike any other if oral sepsis is present and as septic areas are cleared up, so does the blood picture change.

As a last resort in the attempt to save teeth from extraction, and make them safe for the patient, the question of root resection comes up, and in this connection I want to make brief mention of the first installment of a symposium[1] in which the views of four operators are put on record, two of whom (Novitzky and Lucas), consider that operation an absolute failure, while the other two (Blum and Thoma), believe themselves successful in its performance. Of the two former, Novitzky holds every pulpless tooth an infected tooth and therefore condemned to the flap, destruction of external plate and lateral removal mutilation, while Lucas avers that he is not an "100 per cent pulp vitality man," but finds the resected root ends and periapical areas filled in with calcific tissue which shows infection when examined bacteriologically. Blum and Thoma take the position that root resections may be done successfully and cite cases from their practice in which such teeth are doing service and patients remained well after a varying period of time.

I am in full accord with the findings of the last two operators, having in my possession quite a number of roentgenograms showing teeth with infected and rarefied periapical areas, which after filling, resecting the diseased root ends and removing all infected tissue in the periapical space resulted in what I firmly

[1] *Dental Items of Interest*, Vol. XLIV, April, 1922.

believe to be from subsequent roentgenological findings, a full regeneration of the entire area with bony tissue. The owners of those teeth are in good health at this date so far as I am able to learn and the teeth are comfortable and useful. Needless to say that these root resections were made under the most painstaking, aseptic precautions, the wound closed at the time of operation and healing by first intention resulted. No resection is performed on a patient suffering from metastatic involvements at the time of operation. One frequently sees reference made to the selection of cases for root resections, without a statement as to how they are selected. Personally I like to confine such operations to the eight upper and six lower anterior teeth, if but a small part of the root end is involved and if mouth is free from pyorrhea. Such a procedure is never undertaken if the patient is below par or shows evidence of ill health and even when in good health, the number of other teeth in the arch, their condition, the age, sex and social status of the patient are determining factors in such cases.

Treatment of dental focal infections.—The attempt to clear up such foci by therapeutic measures should, I believe, be restricted to patients who are in good health, who present at most but few such areas, which should be small and easily reached through the root canals. In patients suffering from metastatic involvements the foci should always be eradicated by surgical means. This should consist in a simple extraction of the tooth or teeth involved without injury to any neighboring anatomical structures which can be avoided. In almost all cases careful extraction is quite sufficient. Gilmer has shown in two thousand roentgenograms taken indiscriminately in cases of plain extraction that no foci remained with the exception of two or three and these exceptions, I believe, were cysts. Obviously the extraction of a tooth with a cyst on its root end is not sufficient, unless it includes the total removal of the cyst membrane, and I believe that in cases which show either a definite granuloma or a liquefaction necrosis and where the granuloma does not come away with the tooth or the rarefied area is of large size, it is permissible to carefully remove that pathology with a curette. This, however, can be done in most instances through the socket of the tooth and no extraordinary amount of skill is required in such a procedure. I remove small cysts through the socket of the extracted tooth and remove them in toto. Granulomata and rarefied areas offer even greater facility of removal and unless the cavity is so large that cutting down on it through the gum is imperative, I do not disturb the gum at all. I make this specific statement because of the mutilation resulting from the so-called surgical removal of teeth which I find unnecessary and which practice I consider a stain on the name of surgery in whose name such injuries are inflicted. I realize full well that in making this statement I am in disagreement with some practitioners but such is my personal experience. Various technics are employed by different operators, ranging from those who never curette to those who practice extreme alveolectomies, which latter practice often results in permanent discomfort and injury to the patients so treated. In my opinion an alveolotomy, never an alveolectomy, may be done where there is an abnormal thickness of the alveolar process or a protrusion causing difficulties in the adaptation of a well-fitting denture. The reduction of the alveolar ridge to conform as nearly as possible to that which nature produces in from one to two years, if desirable, can be accomplished to better advantage and without injuring the gums by removing the spongy bone between the sockets after extracting, allowing both external and internal plates to stand and then bringing those two plates together by pressure, thus molding them to assume the best

form for an early impression. This treatment furnishes plenty of room for the removal of any infection, which may be about the apical areas of such teeth, and if the gums are closed with just enough sutures to hold them in position, a very small space is left between the two plates which is quickly filled in by nature with spongy bone.

In conclusion, let me say that the evidence cited in this paper shows quite plainly that we have not yet arrived at a satisfactory solution of the treatment of dental foci of infection, and I have given my treatment in cases of this kind, which I believe to be justified in the light of our present knowledge. I am in full accord with the statement made by Noyes in his discussion of this subject, in which he says that this is first and foremost a biological problem rather than a mechanical one. Indeed, I will say that the mechanical phase of it is very near a satisfactory solution, but the most important element, the biological problem, is still in an unsatisfactory state due to the fact, as he says, that in root-canal treatment we must learn to think in terms of cells and cell reaction and not in terms of mechanical procedure and drugs. This also emphasizes the position Moorehead (8) takes in a discussion of principles relative to the cause and treatment of chronic infections involving the teeth, in which he emphasizes the necessity of giving more attention to what he very aptly styled the anterior problem, viz., the study of the cause of decay, including its prevention along scientific, physiological lines. For, it is through efforts made in this field that a satisfactory solution may come, so far as the handling of these cases is concerned. He deplores the fact that the anterior problem receives but scant attention. And yet it is obvious that the final disposition or solution of this most serious question of dental focal infection must come from a better appreciation and greater study of the anterior problem.

I am taking the hopeful view that the near future will bring this final solution. With it the present differences of opinion and variations in practice, will give way to a standardized method of treatment based upon accurate knowledge enabling us to apply the correct treatment in the right manner. I believe that the present attitude of the profession toward this subject and the realization of its importance will hasten the coming of the day of full scientific knowledge.

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A CASTING TECHNIC BASED UPON A RECOGNITION OF THE BASIC PRINCIPLES INVOLVED

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IT IS our intention to present in a rather non-technical manner some of the basic principles relative to dental casting. Admitting the rapid strides that have been made in the field of dental restorations, especially since the advent of an alloy making the cast clasp possible, little attention has been paid to a casting method that would simplify the entire field of casting, from the inlay to the gold plate.

Although the literature on casting might be most interesting, space and time would not permit it in a paper of this kind. However, the following briefly illustrates the divergence of opinion and technic of the four leading operators, on the one detail of casting, *wax elimination.* One consumes eight hours, another three hours, the others fifteen and seven minutes.

Notice the detail of the casting methods of three prominent prosthetic men. One cast his aluminum plates with a bucket and chain, but his gold plates by air pressure using the bulb of an automobile horn as his source of pressure, another casts the gold plates on a centrifugal machine in sections and assembles, and the third swedges his since his failures in casting make it an unsuccessful venture.

When men high up in the profession, recognized as teachers and authorities, have nothing in common and differ so radically, the influence is felt throughout the profession.

It is our sincere belief that when the major principles that enter into casting are better understood, and when the manufacturer gives us a casting unit (an investment, a wax eliminator and a casting machine) manufactured by the same firm, with sufficient research back of them so absolute directions can be given as to mixing of *his* investment to give best results with *his* wax eliminator and on *his* casting machine then and then only will casting emerge from its present chaotic state. The major principles that enter into a casting method are really simple, and if correctly understood, make the casting possible of anything the technician wishes to visualize in wax pattern.

Of the three cardinal principles, investments, wax elimination and casting, one is of as much importance in its correct execution as the other. It is our intention to present only the most important phases of each, phases that are often entirely lost sight of, certain laws transgressed, and then to make the finished product a success, a technic to neutralize this error.

Investment and Investing

Before it is possible for gold to enter the pattern chamber, where the wax has been eliminated, the air within must be displaced, this displacement must be sufficiently rapid, and can occur in one of two ways, by filtering through the investment or through specially made air vents.

Although it is uppermost in the minds of many that the harder the investment the better, there is a decided limit to this as hardness means density, and this defeats the established principle of air exit.

It has been our experience based on countless practical castings, that there is a decided limit to this density to make accurate castings possible, unless the newer methods are used, wherein the wax

is boiled out and special vents are used as by the Pyper method.

If we study the principles of the foreigner who does the small bronze statuary, where the surface must be as they term it a "skin surface" we find that they add certain materials in order to obtain all the porosity possible without marring the skin like or satin finish of the casting.

The treatise on investments by Dr. Louis Weinstein is practically the only source of knowledge we have as to the ingredients that enter into them and their behavior under heat. His conclusions are that plaster is the binder of all investments and that nothing surpasses ground flint as the refractory material. The harder an investment the higher the plaster ratio and the denser.

The density of an investment depends on the type of gypsum and the mesh or fineness of both the plaster and the silex. Although the dentist is not specially interested in the ingredients of an investment it is well for him to know that it contains plaster and this under heat contracts, and above a thousand degrees loses some of its binding properties.

Another important point to know is that a given investment when mixed in a semi-fluid state and when mixed more like that of model plaster yields a difference both as to its resistance to stand the casting impact, which is greater on the more bulky castings, also its properties to withstand heat without shrinking or checking. This is of prime importance to the technician since there are times when he prefers a more porous investment or a denser investment.

Home-made Investments

I believe it is penny wise and pound foolish for a person to make his own investments, and I am basing this on actual experience in trying to work out an investment formula. There are all kinds of plasters on the market, which behave differently under heat. The silex is usually of an unknown mesh and full of impurities, the weighing of the ingredients must necessarily be on very accurate scales, since in the small amounts the least discrepancy changes the entire ratio, not considering the question of mixing.

Is the Plaster Bowl Contraindicated?

If the dentist will examine the rubber bowl in which he mixes his investment the first thing in the morning, when it has had all night to dry out, a chalky like surface will be seen. This is a residue of the previous mix. It is this that has a very harmful effect on a fresh mix if incorporated. It hastens the setting, causes the plaster in the investment to lose some of its binding properties and changes the chemical nature of the setting of the gypsum. If a rubber bowl is used it should be only for investments and instead of the investment hardening in the bowl, it should be washed out. If the surface whiteness does appear the sides of the cup should be scoured with powdered pumice stone.

The ingredients of an investment have a difference in the specific gravity, hence in shipping or standing around the heavier will gradually sift to the bottom of the can. In view of this it should be the policy of all to empty the can into a larger container and shake it up thoroughly before attempting to use it.

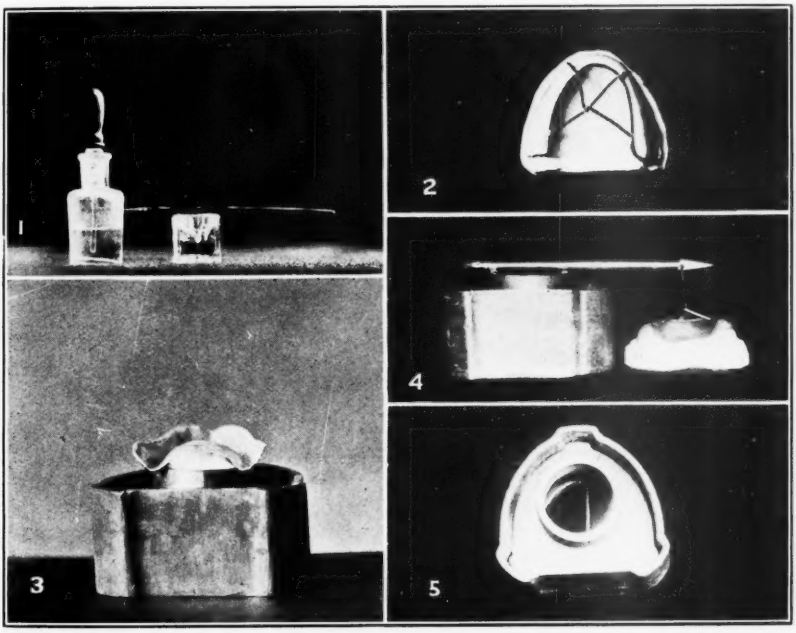
The Weinstein formula of inlay investment is plaster to silica as 6 to 14. The formula giving best results for the writer is 5 to 15.5 although this varies with each barrel of gypsum. Along with this we incorporate a small per cent of specially prepared graphite since it gives more porosity without marring the smoothness, and causes a better diffusion of the carbon on heating.

With the following we give our investing process basing same on the foregoing principles:

On receiving a can of investment it is emptied into one twice the size and thoroughly shaken. If the pattern is that of a large inlay we use the double investment process. A little investment and

water is mixed to a heavy creamy consistency and the pattern is given a coating using a No. 2 sable hair brush. In a clean rubber bowl now mix sufficient investment to the consistency of a model plaster, seat ring on the sprue former and pour the investment. It should be thin enough to pour with slight jarring of cup, yet thick enough to pile up rather than run over the sides of the investment ring.

For small castings we do not use the double investment, but mix the investment to a creamy consistency, paint the pattern, agitate the balance till it starts to thicken then fill the ring. The investment is mixed to the same thin creamy consistency when investing bulky patterns like the unit castings of saddle and clasp as in the Roach method. Since we cast onto a model which must not be subjected to a high heat the porosity of the investment is somewhat hindered by the carbon, besides, due to the thickness of the walls the air must filter through, it calls for more porosity than the castings in a small cup.



Figs. 1, 2, 3, 4, 5.—Fig. 1, for large inlays we advise the double investment method, using a pipette bottle and glass receptacle. The investment is readily mixed with the water using the handle part of the brush to mix with. Fig. 2, sprue leads must be attached to the wax wire, forming the rubber periphery; the wax being heavier at this part makes possible a quick distribution of the gold in casting. Fig. 3, the wax pattern is coated with investment on the lingual side. To coat the palate side, it is invested on the investment ring which offers a very convenient holder. Fig. 4, length of the single sprue riser is very important. This should be, in height, even with the top of investment ring, and the palate portion of wax pattern not over one-half inch from bottom of cup; more than this is apt to cause air locks. Fig. 5, special telescope investment cup for plate casting. Has a nichrome wire in center of bottom to prevent the sagging of the investment from the casting pressure. Wire is fastened at but one end so it will expand with the heat without buckling.

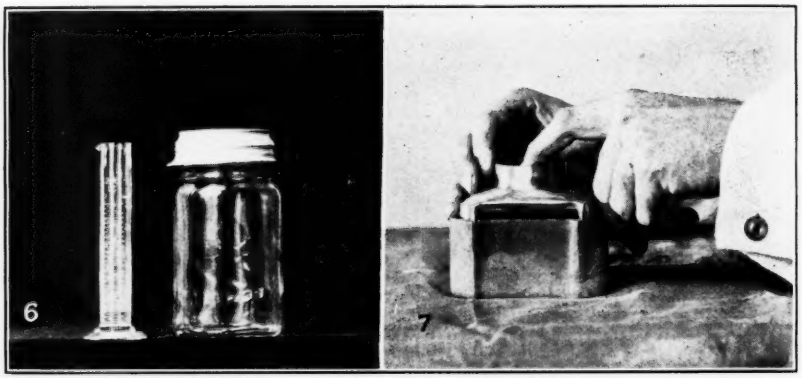
Investment for a Gold Plate

Correctly speaking this calls for a special investment. To make the casting of gold plates possible the investment must be heated red hot, and the investment must neither warp nor check, and be extremely porous.

Mix two tablespoonfuls of investment (leveled off by drawing the straight edge of a spatula across the spoon), add 14½ c. c. of water. Mix this thoroughly and paint the lingual side of the pattern. After five minutes remove the pattern from the model and invert on the investing ring (Fig. 3).

Mix another portion same as the foregoing and fill the palate side of pattern being careful to have this layer lap over the edges. Using the same proportions mix enough to fill the investment ring. It is practically impossible to do this in a fluid state which it must be, with a spatula in a rubber bowl. Instead measure out the ingredients into a pint Mason fruit jar with a screw top and rubber seal. Shake thoroughly for ten seconds and fill the outer investment ring when in this fluid consistency. Now place the previously painted pattern into this so the single sprue comes a quarter of an inch above the cup. Then seat the inner part of the investment ring by placing the index finger of the left hand on this single sprue and pressing this ring to place. This prevents the pattern from getting shifted in the process of seating this inner ring.

Since the sprue chamber is cut in these investments after it has hardened, or in a half hour, the chamber must be deep enough to expose all the individual leads or sprues. These should appear as wax dots in the bottom of the sprue chamber which should be at least an inch in diameter, with an oval or rather marble-shaped bottom.



Figs. 6 and 7.—Fig. 6, measuring glass for water and pint Mason fruit jar in which to mix investment for investing of plates. Mixing is done by shaking thoroughly. Fig. 7, immediately after the plate is invested in the larger outer ring the inner is forced to place. To keep the pattern from leaving its position the index finger of the left hand is placed on the single riser sprue.

Wax Elimination

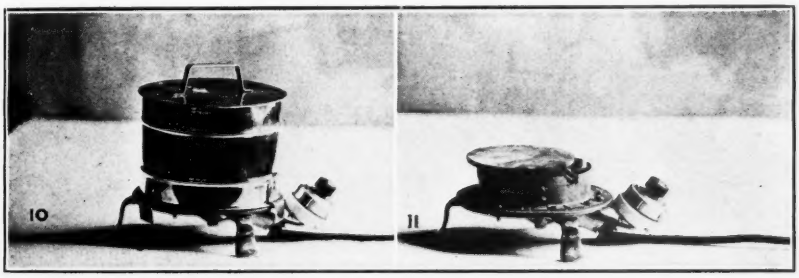
Of the cardinal principles enumerated, the dentist who is dissatisfied with his castings considers his wax eliminating process the least of all. He may change his investment or get a new casting machine but keeps right on with his undependable wax eliminator. The introduction of the Maves electric furnace was possibly the first time an apparatus was given which was practically automatic in its features.

When we considered the principles of investments we learned that plaster is the binder. From Weinstein we get the information that this shrinks in proportion to the time it is heated or dried out under heat, and that it loses its binding properties above a certain temperature.

In eliminating the wax it is very important that the first stage of the heat is low enough to allow the moisture to escape without in the least marring the edges of the pattern walls. An inlay made on correct principles should be as smooth and free from blemishes on the external side as the cavity side. If the cavity side is smooth but the external part with blemishes it means that the heat in the initial stage was too high. The rule that it should not well up is incorrect, since even though it does not well up the heat can still be too high as the finished casting will show. In view of the fact that the first heat must be very exactly gauged, and the high heat must be as high as 750° to eliminate the carbon sufficiently, without which there is not a sufficient porosity, and yet not high enough to mar the binding properties of the plaster, we have an extremely complex proposition.

Just as good work can be done on gas heat as electric. We are positive that the latter is a heat more easily controlled and hence more automatic, and it is our desire to eliminate the human equation as much as possible.

In an article in the *Dental Review* in 1917 we advocated the use of an electric disc stove, which we had used for two years prior to that time. We still use a stove of the same principle. In this electric furnace (Fig. 3) we use a removable hood. The investment ring sets directly on a removable metal disc, which is of such metal and thickness that the heating element and this disc are so gauged that the heat of the element gradually heats the disc about as fast as a large inlay will permit without marring the surface. The disc being removable, should a person wish to use the furnace again immediately after heating, the disc can be chilled by removing it and in this way we can immediately start with zero heat on a new case. In this oven the heat the first 20 minutes will not exceed 250° and then rapidly rises to 750° in 8 to 10 minutes.



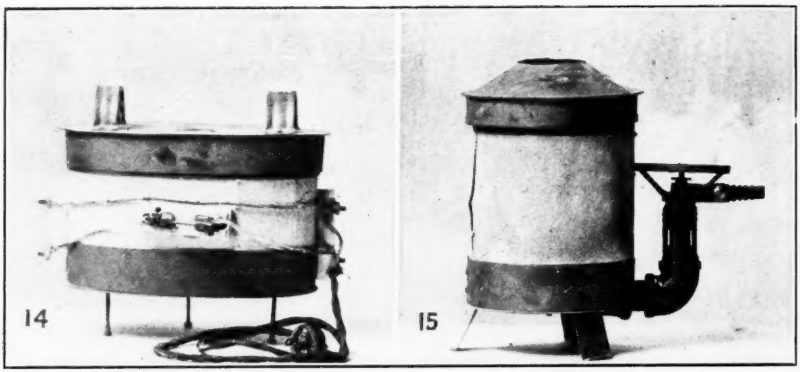
Figs. 10 and 11.—Fig. 10, wax eliminator with the hood. Fig. 11, metal disc used in the wax eliminator. The investment rings are placed directly on this, which automatically stops the heat. Not over 200 degrees the first fifteen minutes and then to 750 degrees the next ten minutes.

The heating of gold plates offers a different proposition. Here the main feature is to get high enough heat, for without this the casting is a failure. Here we use a special furnace simple in construction using three Majestic heating elements. We believe though that a good gas stove is the simplest. The one the writer uses is a combination of a gas stove and the bunsen burner, this gives

us an intense heat sufficient that there be no failure in casting gold plates. In the eliminating of the wax for the larger groups, as the saddle and clasp constructions, where we cast directly upon the model, and where the case is so large as to use either the saddle or large plate flask we are confronted with a new principle.

The writer uses for his model a special model material using a specially calcined plaster, which is harder than any of the cast clasp group of investments, and does heat hence is admirably adapted for this work.

We mentioned the fact that some investments are harder and denser than others. We wish to have it distinctly understood that we referred to the inlay investments. The harder investment known as the cast clasp group, strictly speaking are not inlay investments, but were marketed for the purpose of making models, on which casting could be done for clasp work. However, this investment is now being used for inlay work,



Figs. 14 and 15.—Fig. 14, simple and inexpensive electric burner that will heat the plates to a red heat, necessary in successful gold plate casting. Fig. 15, gas burner for the heating of the investment ring for gold plates.

not shrink. We make this statement because we invest our case with the regular inlay investment and have cast cases two inches long with no apparent shrinkage in the resultant casting. Furthermore if there were any shrinkage of the model the gold would find crevices between the investment and model and would cause a cleavage. Some of these cases have been heated to a thousand degrees.

Dr. Weinstein in his instructions for heating when the Weinstein cast clasp investment is used are that it should not be heated beyond 450° since it will not show shrinkage at this temperature.

The furnace used by the writer will not go beyond this temperature on the first and the wax is eliminated by the boiling process. Due to its high plaster content it makes this possible, but after this it must be dried out at a low heat to avoid any shrinkage. Though we have had no experience with this method, we doubt the casting possibilities unless special air vents are made, as suggested by Dr. Pyper in his special casting technic. So far, if we are correctly informed this work is limited to inlay work. It is my contention that the more a person works with a special process the more familiar he becomes with it. If the boiling out process is not possible in larger castings, it would call for two diversified methods to accomplish a given purpose. We doubt

whether better work can be done by this method, judging from the inlays we have seen from the devotees of both methods. The foregoing is simply expressed as an opinion.

Blow Pipes and the Fusing of Gold

With the extensive casting a dentist is called upon to do these days we believe no laboratory properly equipped should be without one of the high fusing blow pipes. Under this group are gas, acetylene (prestolite) and hydrogen in combination with oxygen. The writer, to settle the question of superiority used for three months exclusively each of the three for any and all types of casting gold. Basing our opinion on this we would say good and bad can come from either. Of the three the oxy-hydrogen calls for less personal equation. There is one rule we learned in casting especially those large castings using the clasp formula, which calls for the fusing of a good deal of gold. There should be sufficient amount of a brush flame as I term it along with the needle point or the high fusing part, to envelop the gold. Unless the tip is so constructed to do this there is most apt to be an oxidizing or carbonizing of the metal. This calls for bigger tips and larger openings so the correct flame on the whole is bigger.

There is no denying that the fusing point of the gold for casting does call for a certain amount of skill and observation. About the best hint we can give, to determine the correct fusing point is in the use of Ney's reducing flux (the black flux), which is my preference of the fluxes used. When the gold is assuming the globular form, sprinkle a liberal amount of this flux on the metal, but keep playing the blow pipe. This seems to apparently chill it, since it forms a coating over all. In due time, by very careful observation, it will be noticed that this mass begins to oscillate with the flame and the sheen of the gold breaks through. When this is observed cast.

Casting Apparatus

Casting briefly defined is the harnessing of a pressure that will force the gold into the prepared mold. However, this must be sufficient so it will reach all the recesses. A force greater than this is apt to cause mold distortions with a resultant distorted casting, and an insufficient force would result in faulty margins or an all round smaller casting.

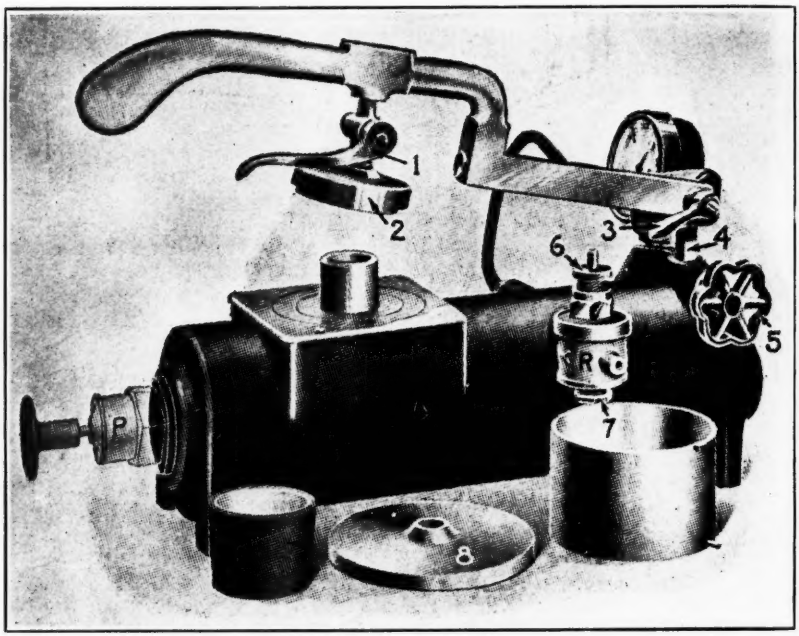
The three types of apparatus used in general are the centrifugal, pressure and suction. The centrifugal is, or at least has been, more universally used though at the present time the pressure type is gaining ground. In a centrifugal machine the force with which the gold enters the mold is dependent upon the length of the arm, the speed at which it revolves, and the weight of the metal. The latter exerts a very perceptible influence. In view of this unless the weight of the metal is uniform the pressure exerted will vary accordingly.

Theories sometimes are at variance with practice. The one feature we must not overlook is that in a centrifugal machine the gold is not started with the full pressure, but some time is consumed for the swing to get under way. Hence the gold is entering the mold with a zero pressure but with a constantly increasing force following almost in an instant's succession. There is no doubt that this entering at low but increasing force obviates the usual casting impact and strain on the pattern walls.

However, due to this momentum and weight the full pressure is not always uniform and besides it is not exerted in equal directions since the momentum is force to be reckoned with. Dr. Knapp has called special attention to this and invests his patterns to take advantage of this initial pressure. The writer has observed these discrepancies, and due to the fact that they did not exist in the air pressure machines he adopted the latter, and designed an apparatus to meet the principle of the centrifugal machine,

especially as we find it in the winding cord in the Roach centrifugal. This method automatically prevents the possibilities of a casting impact, since the force comes with zero pressure but a steadily increasing force.

It will be noticed that in the machine designed by the writer the air is stored in a base tank at the maximum pressure Roach machine. In this way the air instead of shooting the gold into the mold at the full pressure, it, as in the centrifugal, starts at zero pressure but with constantly increasing force till the maximum is reached. It is our opinion that it has been this casting impact of the air pressure machines that caused many to prefer



Two types, No. 1 and No. 2

used, which in inlays and cast clasp grouping is at five to six pounds, and for gold plates eight pounds. When a casting is to be made the pistol grip lever is brought down on the investment ring without jarring same, with the index finger on the casting trigger. This trigger releases the air and is under complete control of the operator. In small castings it is brought up quickly, but in all large castings it is brought up so it consumes at least a second, or about the same as the unwinding of the cord on a the centrifugal. Furthermore we have a very simple mechanical principle. Nothing to wear but this air tripper which can be replaced for a minimum expenditure. This gives us a machine with all the advantages of the centrifugal and the air pressure combined, with the advantage over the former that there is no limit to the size of casting.

The suction machines since the introduction of the Moore perforated inner flask offer a greater latitude in casting. We have had no experience with them.

Compensation in Gold Shrinkage

After the casting of gold the metal passes through two cycles before it again reaches room temperature. From the fusing point to that of crystallization, and from this to room temperature. The point of shrinkage from the fusing point to room temperature is considerable, but under correct conditions this change of shrinkage is neutralized by the feeding of gold from the residue sprues and button, providing this is kept in a liquid state till the inlay proper or casting crystallizes. But should this sprue part crystallize first, then there can be no compensation, hence it will appear elsewhere.

In order to obviate as much as possible independent centers of shrinkage, the operator must guard against having too small a residue button, also in too much abrupt difference in the thickness of the pattern or casting.

Cleaning of Castings

Unless made out of pure gold all castings are oxidized and have a certain amount of adherent investment. Unless cast out of the clasp alloys, heat the casting to a cherry red and plunge into hydrochloric acid, and repeat. Then take the casting and with a soft bristle nail brush scrub it with water and soap to remove the loosened silica.

Summary

1. A casting technic in which the same principles are used from the inlay to the gold plate.

2. Successful casting depends more on the porosity of the investment and easy air exit from the pattern chamber than on dense investment.

3. The maximum density of an investment can be attained and varied by the operator according to the ratio of water to the investment, a thick or thin mix.

4. Wax elimination correctly performed means a low temperature not to exceed around 250° for the first period and then a quick rising of heat to 750° to carbonize the wax sufficiently.

5. The shrinkage of gold can be compensated by having enough residue sprue and button so this crystalizes after the casting proper and by not having too abrupt variations of thickness in the casting.

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Discussion

P. A. Pyper, Pontiac, Illinois: Dr. Burgard did not go into detail of the inlay wax, but much of our success in inlay work depends upon the handling of the wax. The thing to do is to get the wax into the cavity without disturbing the molecular content of the wax any more than is absolutely necessary.

The next thing is not to distort it in removing or in the carving. We now come to that complex problem of investment compounds. I have a long row of them on my shelves and every time I demonstrate some one gives me another kind to try out. Each has some particular advantage but I hope we can soon get down to some definite investing compound, one that will make a smooth wall against which the gold is to be cast. It ought to be neither expanding nor contracting under heat, and hard enough to withstand the pressure of the impact of the molten gold. Such an investing compound will never be compounded until we get some scientific person like the late G. V. Black, who discovered and solved the expansion and contraction of alloys, or a group of research workers with scientific appliances to work it out.

After the wax pattern is invested then begins the great difference of opinion, how to get rid of the wax. The permanent thing to do is to get the wax out of the investment with the least possible disturbance to the cavity or pattern walls. If you burn it out there must be no residue left on the walls. If you boil or steam it out there must be no violent action of the steam or water or it will mar the walls so that when the gold comes out it will be very rough. There is

one advantage of steaming it out, that the wax is completely removed at 212 degrees. It is not necessary to go any higher to dry out the moisture, which lessens the heat danger to the investment compound.

You now have a very hard, dense investment and with little or no porosity, especially if it has a high plaster content. So in order to get best results it is necessary to use vent sprues or wires in order to let the air escape as the molten metal enters. When you burn out you have many severe tests on your investing compound and it must be done with the utmost care, and you do have the expansion or contraction to interfere with the fit of your inlay. It is a known fact that the hotter the mold the less force is necessary to make the gold flow into every detail of the cavity, and the colder the more force is necessary. These facts we must bear in mind in the burning out process. It is also liable to burn up some of the compound, leaving great porosity and roughened surfaces of the gold.

C. B. Mead, Rockford, Illinois: My remarks will refer to inlays only. There is one statement I wish to make which I think should be considered in the elimination of wax patterns. With any method, we have at present, it is an impossibility to completely wash out or dissipate all of the wax without heating to a degree to carbonize the wax and later burn it out completely, which if desirable, would ruin the investment.

I believe it is impossible to cast against any investment, we now have, and produce a perfect fitting inlay.

To produce a perfect fitting inlay it must be cast into a mould that is not overheated, and when not overheated there is always a coating of wax or carbon so the gold never comes in contact with the investment. The carbon between the inlay and investment gives us the beautiful surface the right technic produces and the wax or carbon interposed makes the inlay smaller than the pattern; hence the beautiful fit.

When washing wax from a vulcanite case by pouring boiling water on it from a distance, observe a coating of wax remains which can be removed with a solvent only. Then consider how impossible it is to steam or boil the wax out, completely, through the sprue hole.

I would suggest to those who are not producing satisfactory inlays in order to understand the action of wax, to take a piece, like the large piece of Taggart's wax, invest it flat side up, flush with top of ring so during the dissipating process it can be observed.

When investment is hard—in 15 or 20 minutes after pouring—place over low heat, and keep the heat low.

Wax melts at from 170° to 180° and before the boiling point of 212° is reached the wax will slowly melt and completely disappear into the investment.

Now if steam is created (212°) and the quantity of wax is more than enough to coat every grain of investment and the interstices are filled the steam will carry the surplus wax up into the cavity and boil and agitate until all moisture is driven off when the wax will again disappear. The agitation of the boiling wax has loosened some of the investment and it will be found in the bottom of the cavity covered with a coating of wax, which cannot be seen, but when heated sufficiently high will be carbonized and that pile of investment covered with carbon is what some call a pile of carbon and hence claim carbon cannot be evenly distributed.

A small pattern which does not give a surplus of wax will not return but will agitate if heat causes steam before the wax has a chance to melt and disappear.

When it disappears, say in three or four minutes, a surface remains beautifully smooth. Why not cast against it? We can, but the investment must first be dry.

Eugene Maginnis, Chicago, Illinois: I am much interested in that feature of the discussion, relative to the elimination of wax.

Relative to wax dissipation, we are not able to answer once for all such questions as: What is the exact temperature required for best elimination of wax? How long must the flask be submitted to such temperature to obtain the desired result? Is it better to boil out the wax and how shall we accomplish it? Do we need vents and where should they be placed? We can not answer these questions definitely. We do not know whether we are doing the ideal thing or not. We have found that the temperature of any flask never goes above the boiling point, 212° F. until the moisture is eliminated, no difference what the temperature of the oven may be but when the oven heat has driven off the moisture not held chemically (water of crystallization) then the flask takes on the temperature of the oven rapidly. That is the reason in my estimation why in Dr. Burgard's experience the temperature went up quickly after the stated time; that is the moisture was eliminated and permitted the flask to take on the temperature of the wax eliminating device and not because the metal base was heated slowly. I am of the opinion that what the last speaker said is very nearly correct, namely, that a low temperature carried to a proper point is the desirable method.

Dr. Pyper has done a good deal in the use

of vents, and I am convinced that he is right in their use especially where low heat, (360° F.) dissipation of wax is used. In this method as the investment becomes dry the hot wax in the mould is absorbed into it, leaving the mould free of wax but hermetically sealed when the molten metal entering dams the sprue hole. Under said conditions there is no adequate way for the escape of the air and gas unless a way of egress is provided by vents.

The wax saturated area of investment around the mould is nicely demonstrated by taking a mould where the flasked pattern has been maintained at (360° F.) for say two hours and making a perpendicular section of the same through the center of the mould. Apply water to this half section and the investment material will take up the water readily to the point of saturation except for an area of something like one-half inch in diameter immediately surrounding the mould which remains perfectly dry, this indicating the exact extent of the wax penetration into the investment. It is evident that it is very difficult for the gas and air to escape from such a mould when the molten metal is entering through the only definite opening. Under such conditions (low heat wax dissipation) if we expect to cast with the maximum percentage of good results vents must be used to provide for the escape of the gas and air from the mould, not depending on its escape through the wax saturated walls.

If one carries the heat high enough to burn the wax of the pattern then there is undoubtedly enough porosity established to make casting possible without vents. However, I am convinced that even with this method of wax dissipation a vent placed near the sprue will prevent the defects so often observed in castings at the point where the sprue is given off.

In casting with a vacuum or suction apparatus it is probable that casting for inlays may be made where the flask has been submitted to a heat of 475° F. for two hours.

METHODS OF STERILIZATION IN DENTISTRY*

By H. E. HARVEY, Lieutenant Commander, Dental Corps, United States Navy, Washington, D. C.

I. Sterilization of Anesthesia Syringes

DOUBT has been expressed as to the efficiency of the mixture of alcohol and glycerine in common use for the purpose of keeping sterile, and in some case for sterilizing, the conductive anesthesia syringes and needles. Experiments were conducted at the United States Naval Medical School, Washington, D. C., to determine the sterilizing qualities of the glycerine-alcohol solution with the following interesting results:

A series of tests was carried out to determine the antiseptic power of glycerine-alcohol solution, using cultures of *S. pyogenes aureus*. New barbed pulp-canal broaches were thoroughly contaminated with an agar growth of the organism, then immersed in the antiseptic solution for varying periods of time, and immersed in sterile tubes of bouillon. The tubes were incubated and examined after 24 hours for staphylococcal growth. Four series were run, and the results were uniform. In each series the organism was recovered from the broaches which had been subjected to the action of the antiseptic solution for a period of five minutes or less. No organisms were recovered from those broaches which had been treated for 10 minutes or longer by the glycerine-alcohol solution.

Exposure of antiseptic solution (minutes):

	Growth in bouillon.
1	+
2	+
3	+
5	+
10	0
20	0
30	0
40	0
50	0
60	0

Four series were run and the results in each case were as above.

It will be seen that complete immersion for a period of 10 minutes or over apparently gives satisfactory results.

However, it is a very common practice, when a sterilizing jar containing the glycerine-alcohol solution is used, to suspend the syringe in the solution without immersing the finger grip or the handle of the plunger, and as this portion of the syringe comes into intimate contact with the fingers of the operator, which have in all probability been contaminated with secretions from the mouth of the patient then in the chair, a very fertile field here presents for the transmission of bacteria from the mouth of one patient to that of the next, unless a method for the routine sterilization of the above-mentioned parts is adopted.

Three methods of preventing the above break in a sterile technic naturally present themselves.

1. Complete immersion in the solution for a sufficient period of time.

2. Partial immersion with an additional sterilization of the parts not immersed.

3. Sterilization of the entire syringe by some other method.

The first method necessitates the washing of the syringe inside and out with sterile distilled water upon removal from the solution, and it is doubtful if simple immersion would be sufficient to remove all traces of the tenacious and slippery sterilizing solution.

The second method would require two distinct processes of sterilization.

The third method is one which may be

*United States Naval Medical Bulletin.

effected in a variety of ways, depending upon the durability of the syringe and the office facilities of the operator. Many

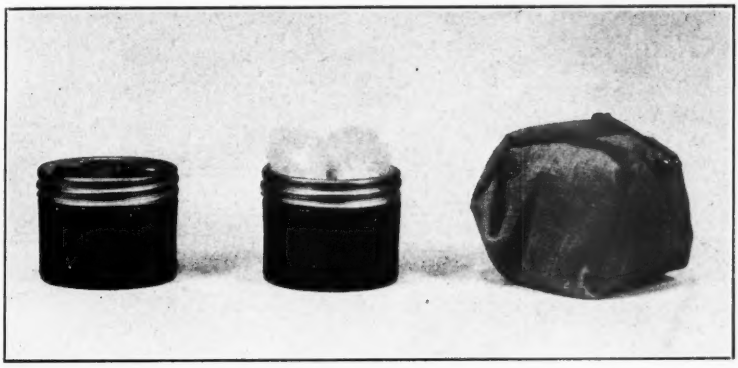

Fig. 1.—Containers for sterile cotton.

of the syringes in use consist of a glass barrel with metal fittings, and the plunging of such an apparatus into boiling water is often accompanied by a slight click, which means a cracked barrel and the necessity of purchasing a new barrel

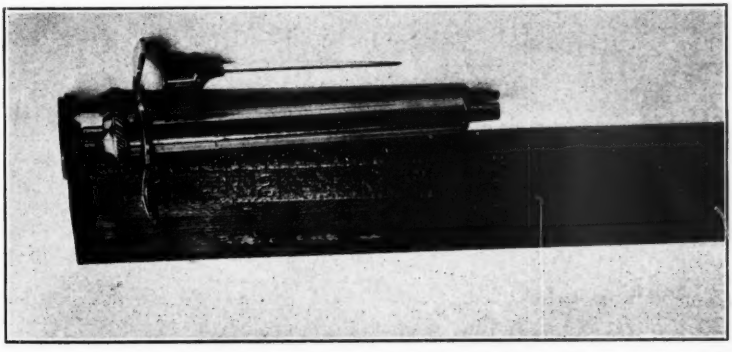

Fig. 2.—Type and size of syringe employed.

with a plunger ground to fit. A simple and efficient method has been suggested for use where a Bunsen burner is available, and consists in covering the

syringe and needle with distilled water of room temperature in a small pan or suitable container and bringing the water to the boiling point and boiling for the required length of time. The Navy, however, has no facilities for operating a Bunsen burner on shipboard, and an endeavor was made to formulate a technic, whereby the syringe and needle could be sterilized by boiling with the dental instruments. In the preparation of this technic several factors had to be considered. Among them that of possible

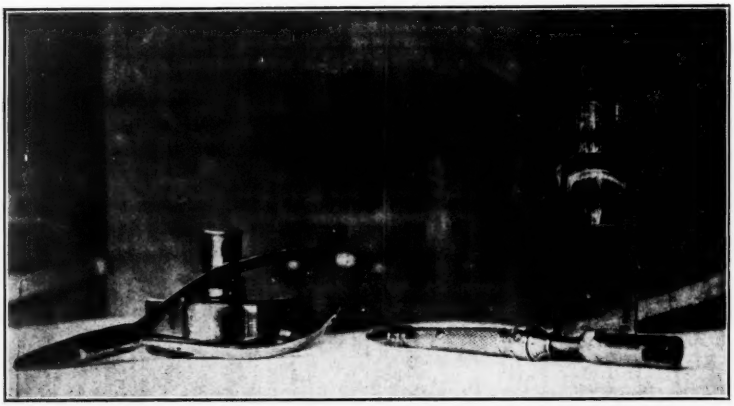

Fig. 3.—Apparatus for sterilizing handpiece in alcohol flame.

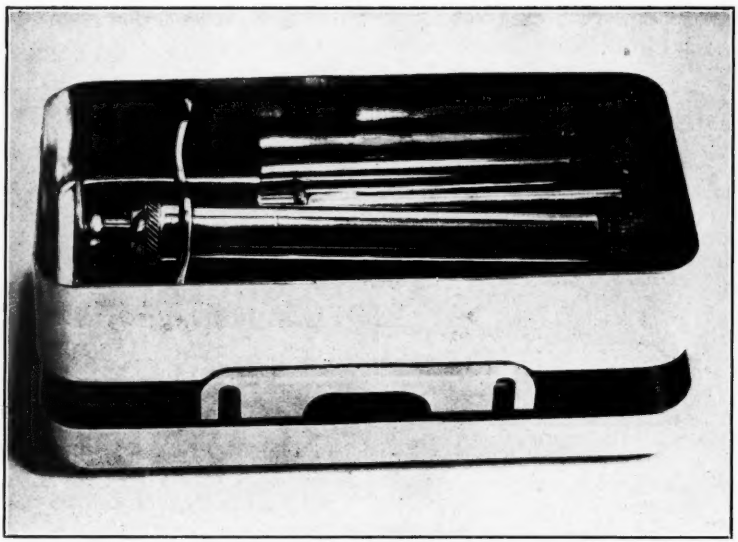

Fig. 4.—Conductive anesthesia apparatus in metal case prepared for emergency sterilization.

breakage and consequent replacement was of prime importance, due to ships being often on duty for extended periods far from the base of supply. Furthermore, traces of alkali decompose adrenalin or suprarenin solutions. Most boiling-water sterilizers contain water to which has been added sodium carbonate or borax.

Fig. 5.—Sterilization of hand piece in alcohol flame.

An improved type of conductive syringe composed entirely of metal, light in weight and without washers, was designed by Captain E. S. Bogert, Medical Corps, United States Navy, in collaboration with the manufacturers, and the resulting syringe and needles are here illustrated and have been adopted for issue. This type of syringe is durable and is not subject to breakage from sudden immersion in boiling water or from careless handling. Possible traces of alkali from the boiling solution may be removed by filling the syringe after its removal from the sterilizer with boiling distilled water from a dissolving cup and discharging into a waste receptacle, repeated several times.

The syringe as issued has also the ad-

ditional advantage of being supplied in a metal case, which can be used as an extemporaneous boiling sterilizer as shown by the illustration. The syringe and needles in the upper container in the illustration, which is normally the bottom part of the case, is covered with distilled water and in the bottom container is placed one-eighth of an inch alcohol, which is then ignited.

II. Sterilization of Dental Engine Hand Pieces

A fault often noticed in the routine sterilization of dental instruments and appliances is failure to properly sterilize the dental engine hand pieces. This part of the dental apparatus is one which is used in the mouths of practically all dental patients and presents an unlimited field for cross infection, or the carrying of bacteria from one mouth to another, unless an efficient routine method of sterilization is adopted as part of every operation.

For a number of years I have been endeavoring to learn of some simple and efficient means to accomplish this. During the influenza epidemic hand pieces were boiled with the dental instruments, but this is not practicable, as a routine measure, for the mechanism of the hand pieces is seriously interfered with in the course of repeated boilings.

Sterilization of dental hand pieces may be effected in the autoclave, but this necessitates a number of hand pieces on account of the time factor and the office of the average practitioner is not equipped with an autoclave.

The following method, while not being offered as a means for rendering the internal mechanism sterile, is certainly an improvement over wiping with or immersing in alcohol and a very decided advance over no precautions at all.

The required apparatus is an ordinary 2-ounce bottle and a medicine dropper, the dropper being placed in the bottle and extending into denatured alcohol. The dropper serves as the stopper when not in use and is of particular value in this respect, in that fitting so loosely into the bottle neck it may be taken therefrom and returned for more alcohol with one hand, while the other is engaged in holding the pliers which grip the handpiece.

With the cone socket pliers grasp the hand piece about the center, and with the dropper drop sufficient alcohol to cover all exposed surfaces; then turn over the pliers and hand piece and cover the other side. Ignite the alcohol and as it is burning drop on additional alcohol to the extent of perhaps one dropper full, to keep the flame alive, then allow it to burn completely. Needless to say this should be performed over the cuspidor, wash basin or other non-inflammable surface and the dropper should be held a safe distance above the flame. No objection exists to sterilizing both the straight and contra-angle hand pieces in the presence of each patient. Hand pieces with hard rubber grips can be treated in this manner with but a slow deterioration of the rubber. However, this may well be charged to profit and loss as the safety of the patient is paramount. The Navy is now using straight and contra-angle hand pieces made entirely of metal. In case the Doriot hand piece is in use it might be well to detach the entire piece including the wrist joint, which is readily done, thus the thumb screw on the end of the handle may be cared for.

Laboratory bacteriological tests seem to justify the method above suggested, as the following experiments were made at the Naval Medical School with the results here given:

(a) Instrument, after being thoroughly sterilized to eliminate existing contamination,

was treated with a bouillon culture of the staphylococcus pyogenes aureus, taking care to work the culture into the crevices. This organism was selected, as it was considered as resistant as any of the ordinary mouth organisms.

(b) The instrument was then sterilized according to the indicated technic, (applying alcohol with dropper and igniting the same). Subsequent immersion in bouillon failed to yield a growth.

(c) As a check on the above, the instrument was treated as in paragraph *(a)* and immersed in bouillon without sterilizing, resulting in a pure culture of staphylococcus. A growth was likewise obtained when the instrument, treated as in paragraph *(a)*, was followed by alcohol without igniting.

III. Handling of Sterile Cotton

The following is a suggestion for simple and inexpensive sterile cotton holders containing a supply for each individual patient.

Holders can readily be made by using the ordinary glass 1-ounce ointment jars with aluminum covers. With the lid on the jar three triangular holes are cut in the lid, leaving a portion of the lid between each hole. The lid may then be unscrewed, cotton placed in the jar, and the lid replaced. The whole is wrapped and pinned in a small piece of muslin and placed in the autoclave or a flowing steam sterilizer for sterilization. Sufficient jars or holders for one or more day's use may be sterilized and held in reserve for use when needed by removing the muslin and placing on the bracket or operating table.

When the cotton is contaminated by the fingers, as in wrapping broaches, the molten metal method of sterilization provides a ready means for re-sterilization.

ETHICS

By C. N. JOHNSON, M.A., L.D.S., D.D.S., M.D.S., F.A.C.D., Chicago, Illinois

(Read before the Minnesota State Dental Association, Minneapolis, Minnesota, February, 1922)

IT IS very gratifying to know that the program committee of the Minnesota State Dental Association has deemed the subject under consideration of sufficient importance to place it on the program at this time. Ethics has been defined as the science of morals, and this is essentially a good definition because in the last analysis, ethics—at least that phase of it which we term professional ethics—has more to do with morals than with anything else. As soon as the difference between professional life and commercial life began to be recognized, there developed the necessity of formulating certain rules of conduct for professional men, which did not in a similar sense bind commercial men. This resulted in a written Code of Ethics which stated more or less specifically just what a professional man might or might not do if he wished to be considered an ethical practitioner. Dental societies made it one of the provisions of membership that an applicant should sign this Code, and abide by its stipulations.

There is no question that the general effect of this has been most beneficial to the profession, and has tended all along to increase the respect that dentists had for their calling, as well as to improve its status in the mind of the public. From time to time there has arisen the necessity for a slight revision of the Code in some minor details to cover matters connected with the increasing complexity of our relationship with our patients, but in the main the fundamental provisions laid down by the fathers of organized dentistry have proved essentially sound and comprehensive.

In 1908 I was appointed by the Illinois State Dental Society to revise the existing Code of Ethics, and accordingly in May, 1909, at the annual meeting I brought in a report which was unanimously adopted. This revision involved some re-arrangement and re-wording of the old Code, and in one important particular it introduced an entirely new provision. Section III reads as follows:

"It is unprofessional for dentists to pay or accept commissions or fees for professional services, or on prescriptions or other articles supplied to patients by pharmacists or others."

That was the first time, with one possible exception that any such provision was ever incorporated in a dental Code of Ethics, and since that date every man who has joined the Illinois State Dental Society through its component bodies from one end of the state to the other has subscribed to that provision.

This society has the largest membership of any state dental society in existence—more than 2,800 active members—and it has functioned under this regulation for the past thirteen years.

It is unnecessary at this time and in this presence to consider in detail the various articles in the dental Code of Ethics, because you are fully informed on these matters. It is with other phases of ethical relationships that I wish to deal—phases which are not, and in fact cannot, be written into a code. There seem to be various tendencies creeping

into the profession today which make us pause, and wonder if, after all, we are advancing in our ideals in consonance with the splendid progress we are making in technical skill and in scholastic training. It will profit us little even though we may become skilled beyond the wildest dream of the most exacting technician, if we permit our ethical standards to deteriorate and fall away into the realm of the imposter and the petty profiteer. Some of the practices that are being followed today by professional men would put to shame the exploits of the hardy buccaneers who sailed the raging main in the good old days, and levied tribute from honest men.

There is nothing meaner in all human relationship than for a professional man to take advantage of his position to impose on, or exploit, the people who trust themselves to his care. It is unethical to pose in a false light before the patient or the public, or to in any way misrepresent facts to the detriment of the people we serve. When an individual takes the chair of a dentist and puts himself under the professional man's care, he thereby places upon the dentist a moral obligation that does not obtain in any of the ordinary business walks of life. And yet there have been too many instances in the recent past where this confidence on the part of the patient has been most ruthlessly imposed upon, and where the patient has been exploited in a shameful manner.

If I refer specifically to three illustrations of the kind of imposition indicated—incidents occurring in widely divergent sections of the country—it is only to prove that the practices herein being condemned are not imaginary, nor are they confined to any one locality. What would be your opinion of a practitioner who, when a patient applied to him with a small cavity in the proximal surface of a bicuspid, made a great ado about filling it, saying that it was absolutely necessary to take an X-ray picture in advance in order to determine if the pulp were exposed? And what would you think of him if, after the picture was made and charged for, and the patient returned for another sitting to get his momentous decision in the manner, he had so far forgotten the significance of the radiogram as to have mislaid it and not be able to find it? And what would you suspect regarding the sincerity of the man when he went ahead at the second sitting and filled the tooth without any reference whatsoever to the picture?

Possibly, you might connect up this procedure with the fact that he had recently purchased an X-ray machine, and felt the urgent necessity of making the money to pay for it.

All honor to the man who equips his office with the requisite apparatus, to efficiently serve his patients, and who then uses this apparatus with an eye single to the patient's welfare; but woe betide the man whose chief incentive in practice is to get some mysterious apparatus, and then play upon the ignorance or credulity of the patients to extract money thereby.

A patient had been wearing bridgework for some years on four abutments. The bridge-work broke and it was the verdict of a dentist consulted in the emergency that the four roots must come out. This decision may have been a perfectly just one, but when the patient demurred somewhat at losing the teeth he was informed that there were seven abscesses on these roots. On the spur of the moment the dentist must have miscounted. Granted that at least two of the abutments were probably on molars, and that each molar had three roots, the sum total of roots that might have been counted was eight. Why the dentist suffered such an oversight is beyond comprehension.

No man has greater charity for mistaken judgment that have I, and no one respects the solicitude of any dentist to remove infection from the patient's mouth more than I; and yet to comment on such a case as this is to go beyond the utmost limits of patience. That magic word

"abscess" has been the talisman which many a dentist has held over a terrified patient to compel the extraction of a coveted organ. It has been played with too frequently by raidographers, by dentists, and by physicians, and upon its altar have been laid the remains of too many harmless teeth.

Another instance illustrating the attitude of some of our profession is even more flagrant and reprehensible than the foregoing. It touches at a point upon which I feel more keenly than I am able to express in words, and opens up an argument into which I am determined to enter even to the point of contention, so long as there is the breath of life in me with which to contend. It involves a principle which has become very sacred to me as the years of my professional experience have ripened, and it introduces an issue which seems to me so clear cut and patent that it is passing strange an argument should never be made of it.

A dentist came to a raidographer who is a painstaking, conscientious man, and said to him: "I am going to send you a lot of full mouth cases, and I want you to charge each one of them $——," mentioning a fee much larger than is usually charged for such work. The radiographer asked, "Can your patients afford to pay such fees?" "Sure they can," was the reply. "They'll have to. You charge them that." And then he added a remark which was the real key to the situation so far as he was concerned—the main spring which had moved him to the conclusion that his patients needed radiographs of their teeth. "You can slip me 25 per cent commission on all the work I send you." Here then was the incentive which forced this benevolent man to conclude that in the protection of his patients it become imperative that X-ray pictures must be taken of every tooth in the mouth regardless of age or condition.

There is no language adequate to express one's contempt for such practices as this on the part of a so-called professional man. The nearest approach to suitable language would be a reversion of Biblical nomenclature, and even swearing at such a man would not comprehensively meet the situation.

There were two grievous sins committed by that man, the one relating to the insistence on having his patients go to the radiographer irrespective of any need of it, and the other the sin of grafting in its most repulsive form. If one grafter can be considered more reprehensible than another, the professional grafter is assuredly the worst of all. There is no basis of argument to justify the payment of commissions in professional life. If a general practitioner refers a patient to a specialist he does it because he believes the specialist can better serve the patient in that particular capacity than he can. In other words he knows in his heart that there is some one more competent than he for that service. It is to him a real benefaction to have a fellow practitioner who will relieve him of the responsibility of attempting to do a service for which he is not qualified. Why then capitalize his own ignorance by demanding or accepting part of the specialist's fee? Or worse, why connive at a fee sufficiently large to recompense the specialist, and in addition to this to pay him a fee for doing nothing?

Commissions among professional men are wrong in principle, and demoralizing in practice. They have never yet led to any substantial material gain to any of those who have indulged in them, and the sooner they are ridden out of the profession the better it will be for all concerned. The moment a man reaches out the hand to accept something for which he has given no return, that moment there begins in him a moral disintegration which saps the very foundation of his integrity, and in the end seriously interferes with the stability of his character. If the practitioner in question were a resident of Illinois and belonged to any of the component societies, he could be expelled for violating the Code of Ethics. Anything which savors of exploiting the patient is

unethical, and the particular abuse under consideration is one of the worst phases of exploitation. There can be no legitimate argument in its favor, and everything to be said against it.

If the members of our profession continue to indulge in practices such as have been indicated in the three authentic cases just referred to, we might as well retire into some obscure corner of the universe, and hang our heads in deepest shame. The splendid traditions left us by the sturdy old pioneers of other days must pass for naught, and we must be known as those who have sold their birthright for a mess of pottage.

In this day of sacred duty, when all the powers of good are needed to combat all the powers of evil, when crime stalks with brazen mien across the landscape of our fair domain, when the moral bonds are loosened until they clatter in the mefitic breeze, when irresponsibility and licentiousness have reached a climax unheard of since the days of decadent Rome—in this day, it behooves us as professional men to gird our loins in the fervid protection of our unsullied name, and pledge ourselves anew to a consecration which shall not falter nor fall till every vestige of deceit and fraud shall have been driven from our ranks. Not until then must you and I cease in our endeavors to purge the profession of this foul pestilence, not till then can honest men hold their heads aloft and proclaim their kingdom to the world, not till then shall the fair fame of dentistry stand untarnished before the eyes of men, and we as dentists may look every other man in the face and be accounted honest before the eyes of the world.

Please pardon the earnestness with which I approach this question. It has become to me such a very vital matter that I cannot bring myself to consider it in anything but the most serious attitude. If we are to eliminate ethics from our professional life we might as well erase the word "profession" from our lexicon, and acknowledge the trade-mark of a commercial pursuit. One thing in human relationships is worse than anything else—to hide under the reputation of being a professional man—to use this as a cloak to deceive the people, and then to indulge in practices which comport only with the methods of the confidence man and the faker. There is nothing viler than this. It is a direct prostitution of the reputation that has been laboriously built up by ages of consecration to duty on the part of the many splendid men who have devoted their untiring energies to the elevation of their chosen calling. Pity the day when the superb edifice erected by these noble men of the past shall be sapped in its foundation by the canker of a decadent spirit, and we are relegated to the plane of profiteers.

And, yet, my friends, I would not bring before your eyes a picture so pessimistic as this if I did not see over and beyond it all a rainbow in the glowing east. Out of the mist and fog, out of the clouds and mental aberrations which have darkened our professional horizon at times, there comes to my vision a wondrous ray of light and hope. I have a picture of the future when the souls of men shall be born anew, when the sacredness of service shall gain sway over the practices of the present, when the few disintegrating tendencies of the hour shall be swept away with the onrush of a sublimer faith, and when men shall come to know the sanctity of work, and the sordidness of material gain.

Till that day comes, you and I have a paramount duty to perform, a duty involving the welfare of our beloved calling. We should pledge ourselves not to abate one jot or tittle of our energy to stamp out on every occasion the first semblance of such practices as have just been alluded to, till it shall become a universal sentiment in the profession that no man can indulge in such practices and go freely among dentists as one of them.

When such a sentiment makes itself sufficiently manifest these practices will cease.

FUNDAMENTAL PRINCIPLES OF PSYCHOLOGY AND ART THAT MAY BE APPLIED IN PROSTHESIS

By EDWARD H. BRUENING, D.D.S., Omaha, Nebraska

THE object of this paper is to try to show how interesting are some of the fundamental principles of psychology and art and how these principles may be applied to the work of the prosthetist. This study can be divided into the following four phases:

1. Training the eye to observe and accurately record. Old age and youth are both beautiful. The skilful prosthetist should know at a glance what to do to restore charm that is lost when the mouth becomes edentulous.

2. The study of types—to be able to classify our patient according to his characteristics. We will take up only a short description of each of the five types. Every individual is complex but it is not difficult to determine his predominating type. Character reading has become a very interesting study and one can easily obtain information that he can use to advantage in his daily practice. It is possible that our habits and even our thoughts are disclosed to him who can read them in our faces, figures and actions.

3. Art anatomy, a study of the form of the human body with particular attention to the face and head as its chief component parts. Let us see how carefully the art student studies surface anatomy, and he only paints it.

4. An application of principles. This can be shown by briefly describing a method of practice.

Training in Observation

The true artist knows just what he is going to do and how he is going to do it before he makes his first effort toward production. He has a clear conception of his finished work before the first stroke of the brush is applied. So it should be with us. To gain this knowledge one must carefully train the eye to observe and the brain to record that which we consider normal, beautiful, esthetic, true to type and harmonious. Careful study and practice with pencil, clay, wax, pictures, measuring instrument, or whatever one may choose to aid him in training the eye will bring about results. One can go deeply into this important phase and find the work very interesting and useful. Membership in a local fine arts society is an incentive to study.

The power of seeing objects correctly is gained by a careful examination of their general appearance, and of the component parts which produce such general appearance. First examine as a whole, to be convinced of the leading features, the various shapes the principal lights take, also the form of the darks, what occasions them, and why they are darker in one place than at another. We can influence hues of teeth by arrangement.

Types

The prosthetist should know the five types that create form and character in man. They are the alimentive, the tho-

racic, the muscular, the osseous and the nervous. Each have many distinguishing features, but only a few of the most important will be considered.

The Alimentive Type: Can be briefly described as having a large mouth, small depressed nose, globular cheeks and chin, slow motion, slow pulse, large abdomen, voracious appetite, partial to liquid foods, loves sleep and ease, mind free from anxiety or care and apparent deficiency of capacity for mental effort. Animal examples are the hog and rhinocerous. Here one can recognize our "genial" fat man, and if he is too fat we get a hint of the limitations of his productive ability, both mentally and physically. He is particularly interested in food and his chief worry, when he looses his teeth will be, "can he learn to eat with artificial teeth?"

The Thoracic Type: Is represented by the organs of respiration and circulation, the heart, lungs and liver. The outward facial signs are the nostrils. These are large and of good color, the cheek bones are rather high, there is a full throat, large rounding chest, elastic step, comparatively small abdomen and brain. The greyhound and deer are animal examples. Pioneers, fighters, orators, and aggressive people in thought and action are well developed in this system.

The Muscular Type: Assists formative effort of every kind, whether literary, artistic, mechanical or in rebuilding the human race. Predominance is indicated by a short nose, full convex eye, round short ears, short thick neck, rather broad form, well developed muscles, quick elastic step and broad shoulders. Mental constitution disinclines to study, love for motion predominates. This type is inclined to commercial business and such classes of trades which bring in the social element.

The face has thirty-six pairs and two single muscles, and the body has more than five hundred. The eye is the facial exponent of this system. The larger, more convex and deep colored the eye, the greater the muscular strength. The muscles of the eye and the optic nerve bring the world into the mind of the individual and shows to the world the will of the man as he stands revealed before our gaze. In muscle development, quality is of greater importance than size. Magnetism is a force supposed to belong to this system.

Osseous or Bony Type: This type is known by height, large joints and bones, high cheek bones, projection of the lower part of the forehead over the eyes, prominent broad chin, large bony hands, long flat feet, tips of fingers square, relatively small angular head, high above the ears.

Bone is substantial, and well suited to mechanical and scientific occupations. It signifies patience, perseverance, integrity and a true eye for angles and straight lines.

As animal comparisons, the mole, cat and rat have small bones and large muscles suited to their slyness, skulking, deceptions and craft. Their bodies are sleek, sinuous, graceful and quick-motioned, representing the muscular type. Compare with these, the camel; his great homely, bony structure, his fidelity and usefulness, docility and intelligence. The ox with his slow patient ways, the horse with his large hip joints and bony face as of the osseous type.

Nervous Type: Signs of predominance of this system are a pyriform or pear-shaped face, large head, high above the ears, broad full forehead, bright eyes, small nose, thin hands and feet, thin nails, thin nostrils and lips, small bones and muscles, slim neck, small abdomen, quick motions, rapid speech. These people are earnest, excitable, acute, sensitive,

and emotions are easily excited. The faculty of reason is dominant. They want to know why and will understand.

Fig. 1.—The nose and ear are parallel.

The size of the brain is not always proof of a greater mental power or lack of it. A fine skin, fine hair and brightness of the eyes are signs of sensitiveness. The individual with coarse skin and hair is not easily insulted. Compare the hog with the deer and the dog.

Fig. 2.—Ideal type.

Those who have the brain system predominating over all others are opinionated, sometimes vain, almost always pure minded, and if of fine quality, desirous of the good of others.

Where the five systems are in good proportion the most happy results follow. Such a one was George Washington. He was six feet three inches tall and each system was of fine quality. Size alone is not a measure of power.

A knowledge of the general truths of biology and psychology will make possible a rational interpretation of social phenomena as we find them. Herbert Spencer in his essays on education, says, "The actions of individuals depend upon the laws of their natures and their actions cannot be understood until these laws are understood."

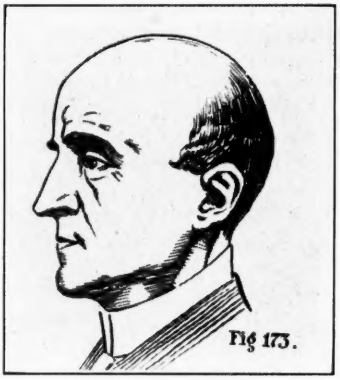

Fig. 3.—Mental predominance.

Art Anatomy

Proportions: The human body is designed with geometrical accuracy. A horizontal line drawn through the outer corner of the eye will divide the head from crown to chin into two nearly equal portions.

The height of the head is a unit of measurement commonly used by sculptors, 8½ to 9 inches. A six-foot man is eight heads tall. From the chin to the nipples is the same as the head. The

breadth of the head across the eyes is five eyes length. The space between the eyes is one eye. The following distances should be equal: eye brow to chin, ear to ear, ear to nose. Line of the nose and

Fig. 4.—Strong physical predominance.

of the ear are parallel. The distance from the chin to the nose is the same as from the nose to the glabella. The distance from nose to mouth should be one-half from mouth to chin.

The location of the opening of the ear is a landmark used for measuring the shape of the head. The head possessing a normal brain, wherein the mental and

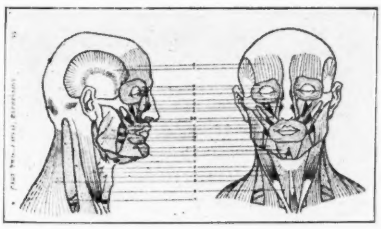

Fig. 5.—Muscles of expression.

physical qualities are well developed, lies two-thirds in front of the ear orifice and one-third behind. When three-quarters or more are in front of the ear then a high mentality and low physical powers are indicated. If one-half lies in front of the ear, and the height of the head less than normal, low mentality and strong sensuousness is indicated.

Fig. 6.—Contours of the lower half of the face. Vanderpoel.

The muscles of expression are given the following names which express their action: Frontalis, surprise muscle;

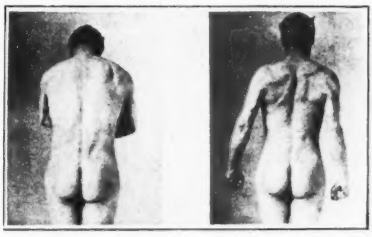

Fig. 7.—Surface study.

Temporalis, masticating muscle; Orbicularis Oculi, reflection muscle; Levator of upper lid, sleeping muscle; Tensor of upper lid, waking muscle; Nasal, lewd or rage muscle; Levator Labii Superioris, sobbing muscle; Levator of mouth, sneer-

ing muscle; Quadratus Labii Superioris, laughing muscle; Masseter, determination muscle; Buccinator, trumpeting muscle; Orbicularis Oris, kissing muscle;

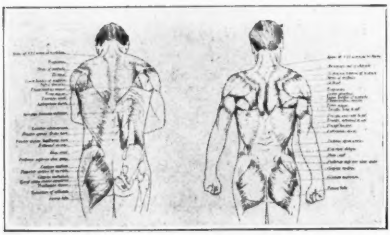

Fig. 8.—Muscle and bone structure that produces surface forms.

Depressor of lower lip, disgust muscle; Levator of lower lip, contempt muscle; Corrugator, pain muscle (it lies under

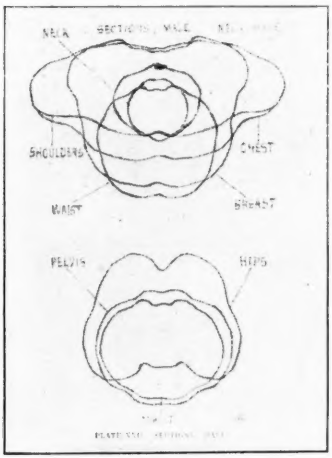

Fig. 9.—Comparison of cross-sections through the body.

the reflection muscle and is also the "crowsfeet muscle").

Many of these muscles have fibers in close relation or blended with those about the mouth and any change produced in this area influences the expression of the entire face.

The cuts show how the art student must study surface anatomy. We should also be able to appreciate beauty and harmony of proportion in all parts of the human body, though we limit our work to the mouth and face.

Application of Principles

Use an average, balanced type patient, judged as described under heading of

Fig. 10.—Beauty of form.

types. As we are more frequently having cases for full denture restorations in which the patient must lose quite a number of teeth on account of foci of infection, we can take advantage of records of the case before extraction and postoperative methods based on psychological as well as physical principles that will greatly aid us in producing more satisfactory results, from several viewpoints.

By the use of a camera we can very quickly obtain good photographic records of our patient by taking a full front view,

a sharp profile and perhaps an open mouth picture. The Speed Graphic 3¼″x4¼″ fitted with a 1 c Tessar lens mounted on a No. 1 Korona folding stand, has proved very efficient. One of the large photographic material houses has recently installed a medical department to take care of such work as ours.

Use a light gray or yellow cloth for background with patient seated in the dental chair, and keeping the cloth in motion during the exposure. Double-coated plates have greatest latitude and eliminate the danger of halations. Admit the light from the upper window sash, having a sliding curtain of light material over lower half of the window. Use a lens cap for making exposures.

The use of wire measurements as described by Dr. Robert Gillis of Hammond, Indiana, should be routine practice in all cases. Take a No. 16 gauge copper or aluminum wire and bend it over the head and face to the neck, carefully recording all irregularities of outline. This can be done with the fingers except at the junction of the lips, where a pair of pliers will give the desired sharp angle. This wire guide can then be attached to cardboard and a negative cut out that can be more readily fitted to the face.

Next take accurate compound impressions of the teeth and gums to make study casts that will aid in reproducing tooth form and surface outline of the gum tissue if they happen to be normal or if improvement can be made these casts can be used to demonstrate the change. Take the impressions in two sections; first the labial surfaces of the teeth and soft tissues high up as far back as the second bicuspid. A piece of soft metal about a half inch wide is suitable to force the modeling compound into position. Trim, replace and then take the remainder with compound in a tray with the anterior portion cut away.

The next step is to take compound impressions of the incisal and occlusal surfaces deep enough to hold the natural teeth after they have been extracted. This gives one an opportunity to reproduce the irregularities of arrangement, color, form, fillings, etc.

The case is now ready for the removal of the teeth and all foci of infection. Remove or reduce the prominence of the anterior alveolar ridge only as much as will interfere with proper facial contour and the muscles of expression when the denture is in position. This may be alveolectomy or by removal of the septal bone and the plates brought into closer contact. There must be no sharp margins that will cause pain when pressure is brought to bear upon them. The fewest possible sutures should be used to avoid tension and tissue displacement, also unnecessary cicatricial tissue. In many cases suturing is unnecessary. The prosthetist should be in close contact with an exodontist or oral surgeon who will do this work under his direction.

Immediately following this operation, take sectional impressions with modeling compound. Put a roll of compound around the labial and buccal portion of the tray; place with an upward and backward motion, gently forcing the tissue lingually; remove and put a cone of compound in the palatal portion and let this crowd the lingual tissues labially. Make a cast and smooth it freely with a knife. Over this mold a sheet of heavy base plate material to be used as a splint. It will hold the tissues together and mold them to smooth form. Build on a modeling compound ridge that will be the same length as the teeth were or a little longer. This will be a rest for the jaws and retain their normal relations or central occlusion. Paint the appliance with a thin solution of collodion.

These bases must be removed every hour, carefully brushed with soap and cool water, put into cold water for ten or fifteen minutes, then replaced in the mouth for the hour period. Irrigate the mouth freely with normal salt solution. The use of a water syringe will facilitate this. Two 16-grain Sodium Chloride

tablets (P. D. No. 365) to a glass of hot water is an easy way to prepare this solution. Our patient will become occupied with a treatment that will keep him busy enough to help him forget his discomfort. Since these bases keep his lips in normal position, he will not be willing for anyone to see him without them; since they provide a rest for his jaws he is learning the "feel" of artificial bases under conditions which, in spite of the discomfort, favorably recommend dentures. His tongue is becoming accustomed to the artificial palate and the foreign substance in the mouth, and he is acquiring skill in holding it in position. Swelling is controlled and there is less soreness than is usual. A gentle massaging action by the pressure exerted with the rims are brought into contact, stimulates circulation and the healing process is facilitated.

When the bases are first inserted, although they do not quite go to place, this need not disturb the operator because we are molding soft tissue to desired form, and in an hour he will have them in general contact. We want him to have the most unpleasant sensations at this time, as it gives us an opportunity to make him more comfortable as we progress with the case instead of having him most uncomfortable when we first put our finished dentures in the mouth. By these methods, which are of great psychological as well as physiological value, we are enabled to gain his confidence and co-operation in the most satisfactory manner so that his attitude is characterized by optimism and appreciation and he is willing to believe that he will soon become accustomed to his dentures.

The second day after operation, we remove the sutures that may have been used and take new impressions, better ones this time, and when the patient returns for treatment the third day the new bases are ready. They fit more accurately and are more comfortable. Allow him two days, then re-fit these bases by adding stick compound on the margins where we wish to exert more pressure. Irrigate with sprays and remove loose tissue each time the patient comes for treatment.

In some cases anterior teeth may be set on the bases with compound. Sometimes it is best to make a third set of bases, but usually two are enough and by adding compound, we can keep them adapted as we desire them to be. However, conditions must govern this.

Two weeks may be long enough for the ridges to heal sufficiently for dentures. Take every precaution to prevent the patient going without his appliances in the mouth until the dentures are finished; he must wear them at night because he can sleep better with them in, than without them.

It is necessary to make our patient realize that he is in real trouble and we are the ones to whom he must look for relief; that his case is serious enough to need our most careful attention and that it is his duty to follow directions most carefully.

During this time we have had an opportunity to study our patient, test different lengths of bite, watch expression, keep a check with our photographs and guides. He has been instructed in the subject of wearing dentures and what to expect from them. Perhaps he can bring us a photograph that was made some time previously that will be an aid in building for expression.

In selecting molds, hues and in setting up the teeth, D. D. Campbell has made some valuable contributions along psychological lines as published during 1920 in *The Dental Summary*.

Many adaptations of this method can be made to make it easier for our patient to learn to wear the artificial appliances we can produce. No matter whose method we may decide to use to get impressions or to reproduce the movements of the mandible, no matter how artistically and anatomically we may finish our dentures, we must ask our patient to bridge that tremendous gap between his firm com-

fortable, masticating and articulating organs and our artificial substitutes.

When the dentures have been worn a few days watch the efforts at mastication. Have him try to chew a substance that is not very hard and note his muscular movements and make corrections that will make him more comfortable. Instruct him as to diet, habits of cleanliness, wearing his dentures at night, etc.

We must handle every case according to its peculiarities and combinations of types. They are all different and our success will largely depend on our ability to recognize those differences and treat accordingly. M. M. House's classification plan will be found very helpful.

Photographs of our case after the dentures have been worn are sometimes valuable for comparisons with those made before operating.

Explanatory Note

I realize that I have covered a wide range of subjects, each one of which could better be explained by a separate article. The National Society of Denture Prosthetists is taking up detail study of denture construction in all its phases and it may some day compile a series of such articles that would be very valuable. The man who practices this specialty should be an artist and a psychologist.

It is a difficult matter to always give credit where credit is due, but to the following I am particularly indebted: Doctors D. D. Campbell, Robert Gillis, M. M. House, R. E. Hall, Leon Williams, George Wilson, Geo. Monson and Claude Stansbury.

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ORAL HYGIENE IN PRIVATE PRACTICE AND PUBLIC HEALTH

By W. H. CARD, D.D.S., Minneapolis, Minnesota

(Read before the Minnesota State Dental Association, Minneapolis, Minnesota, February, 1922)

IN THE last few years the profession of dentistry has had a great awakening to the significance and importance of mouth pathology as related to general health. In addition to the necessity for improved and more skilful operative technic, comes the added moral responsibility for the health of our patients. It takes only an ordinary observant mind to realize that there is a limit to his mental and physical capacity which is being severely taxed by these increased responsibilities and that the best solution of the problem of non-vital and infected teeth is to prevent these conditions. The practice of the principles of preventive dentistry is the only salvation for the high-tension dentistry of today. I do not mean that we should all cease the practice of reparative dentistry, and from now on do only the cleaning up and polishing of the teeth. No one appreciates more than I or tries harder to keep in step with the constantly improving technic in both operative and prosthetic dentistry. I do mean, however, that as general practitioners in dentistry while we nearly all recognize oral hygiene as the very foundation of all successful dental operations, yet many of us are not practicing and teaching these principles, and this we must do if we ever expect to make dentistry qualify as a noble and learned profession.

Every dental magazine of today contains most excellent articles on oral hygiene and my only excuse for preparing this paper is that I hope by repetition, to stimulate an even greater desire in your hearts to do your full share in that branch of our profession which is slowly but surely coming into its own.

In the office, there isn't an operation in the mouth but what is guided by some of the fundamentals of hygiene, beginning with clean body, including, of course, clean face, hands and nails of both dentist and nurse or assistant, then clean personal linen, sterile instruments, cotton and other materials, and so on through the whole list of requisites. In approaching the operation itself we first must secure and maintain a relatively clean field to work in. It is inconsistent, to use the mildest term, to perform any operation in the mouth without first making that mouth as clean as is possible to do by modern prophylactic methods.

At this time also the patient should be instructed fully on the proper way to maintain the highest degree of cleanliness, with all that it implies. The proper instruction of the patient is very important, and here your dental hygienist or assistant may give invaluable assistance.

In his zeal for locating infected teeth,

impacted and unerupted teeth and the like, the dentist should not fail to note all pyorrheal conditions. The same little old enemy streptococcus lurks under the margins of low tone gum tissue as in the blind abscesses, granulomas or cysts, even if not of such high virulence. In short the dentist should consider the health condition of the investing tissues of the mouth first—the reparative needs second. The health of the investing tissues and the general health of the patient are inter-dependent. So that when you consider the one you are also considering the other.

The children who come to our offices require and should receive special attention. Much depends upon first impressions, and while we cannot all have sandboxes or rooms fitted with playthings and attendants to furnish with clean aprons, we can do much to make their first impressions pleasant and right ones, by using tact, pleasant and kindly manner, and never unnecessarily inflicting pain.

When we speak of educating the public we usually think of the adult public. However, as most of our adult parents' ideas of dentistry are those formed in childhood, and also because in the adults the damage whatever it may be is already done, the children are really the public we wish to educate, and it must be done in the homes, in the offices and in the schools.

Authoritative statistics claim 38 per cent of all deaths occur under the age of fourteen years, and most of these from preventable diseases. Here is wonderful opportunity as well as grave responsibility for the dentist. Fifteen years ago tuberculosis headed the list of all diseases causing death. Since that time, due to education by the medical profession in preventive care its mortality rate has been reduced over 50 per cent. Now heart disease has the lead and a majority of heart cases are caused by diseased teeth.

In Minnesota we find fully 95 per cent of our school children with unclean mouths, or needing reparative work done. As high as 30 per cent in some communities show need or impending need of orthodontia, much of which is caused by adenoids or bad tonsils. Dr. Fones, of Bridgeport, Connecticut, started some years ago to work out some very careful and thorough experiments in the Bridgeport schools. He has conclusively shown, as have others since, in other schools of the United States, that by taking a child immediately upon entering school and by frequent periodical prophylaxis, filling of needed cavities, doing necessary extraction, correcting of irregularities and teaching the necessity and proper use of the toothbrush, he has raised the standards in morale and scholarship. Raising the child's resistance to disease has reduced to almost nil the percentage of scarlet fever diphtheria, measles and all the other childhood diseases, and there is no greater or more effective agency known than oral hygiene in building up resistance to disease.

The extreme susceptibility of children to pus makes it imperative that all abscessed teeth be removed. The bacteria of the mouth with their toxins are ever ready to attack the body when through some incidental cause the vitality is lowered. Every child is entitled to a fair chance in life. They did not ask to be born, and if knowledge which we possess is withheld from them or their parents, thus resulting in suffering, deformity or death, are we not criminally negligent? And yet there are some men in our ranks who if not actually telling parents that the saving of deciduous teeth is unimportant due to early loss, are giving silent assent to that vicious statement by entirely ignoring the saving of

these first teeth, or giving them attention only on demand of parents that something be done to relieve the little duffers from their sufferings. Then the remedy is usually the forceps. Then again because they do not themselves do orthodontia they ignore the need, or impending need for same. The toothbrush is up to the present time the most efficient agent known in the prevention of decay. Yet it is said that less than 10 per cent of the population of our country use toothbrushes. This is due to ignorance. Tell the children why they should use the toothbrush, then tell them how to use it. Telling them only that they must use it usually brings no benefit.

Invariably in appearing before a school room and asking the children how many have brushed their teeth that day, maybe half will raise hands. Then ask how many washed their face, and practically all hands go up and with it a chorus of laughs. Let us educate these children in oral hygiene so that a suggestion that they haven't brushed their teeth is more ridiculous than having neglected washing their faces.

Proper use of the toothbrush never hurt anyone. We have all seen much harm from lack of use. The exact method of use is of lesser importance. I favor and teach the method described as "from gum to biting or chewing edge." Do not confuse this method of brushing normal children's mouths with the therapeutic brushing advocated for pyorrheal conditions.

Do not, however, for one moment believe that caries is entirely preventable by the use of the toothbrush. I believe diet to be the greatest factor today in the problem of caries, as well as nutrition of the child. I also believe that until the physiological chemists and medical experts become agreed upon principles of dietetics, that a uniform text for the teaching of proper diet will never be adopted. The chemistry and physiological details, however, are unimportant as compared to a safe, sane and easy common ground upon which physician, dentist and teacher can meet and agree, until we do have the finer and more technical details settled. We need more data on what is necessary and good for a child, and less of what is good or bad for rabbits, guinea pigs and rats. Common sense would favor our judging the number of different kinds of food by the number of different kinds of teeth. Common sense would also indicate that kind of food which gives the masticatory organs fair exercise for use increases function, and we must have exercise of the muscles of the jaws if we expect normal development. This would indicate balancing the diet with coarse and hard foods. However all hard foods are not good foods. A child cannot very well masticate or live on bones, though a nice smooth bone without sharp corners is a splendid thing for a young child to cut its teeth on.

I believe with many modern authorities that the saliva is an oral hygiene adjunct as well as a digestive juice. I also believe that it is desirable to finish a meal with that kind of food which tends to leave the mouth physiologically clean, such as fresh fruits rather than sweets. I also believe that candy is a curse, though admitting a most keen appetite for same, since early childhood. I account for miserable teeth from this cause more than any other, in spite of better than average care at home and by the dentist. I do not believe that so-called "natural craving" for candy is natural, but is an acquired taste, which develops quickly and easily in children. J. Sim Wallace, English dental surgeon, has written among other works one on "Child Welfare," which I urge you to read. This particular publication is full of common

sense reasonings and deductions and the presenting of some old ideas at a new angle. I have little time for the pappy type of breakfast foods with their excess of sugar and cream. Our children are also too much fed up on wheat cakes with sugar or syrup and doughnuts. Coffee and tea have no place in the diet for a young child. There ought not to be much difficulty in working out a common sense balanced diet for children, and nature is a fair guide when it comes to quantity. The normal child usually eats about the proper amount without care or worry as to number of calories, vitamins or amount of roughage.

Every community should see to it that children whose parents are unable to pay for dental attention should not suffer from lack of it. Free dental clinics are a necessity in large cities, even though the operation of same is fraught with the problem of political graft or the more delicate one of paternalism.

In the schools the economic question also is a factor as many of our "repeaters" or "delinquents" have deplorable mouth conditions, which when cleaned up show most marvelous results in improvement in scholarship and mental alertness. In the Minneapolis Public Schools the present per capita cost per annum is $87. It cost this city in 1921 over a quarter million of dollars for "repeaters."

Psychiatrists have some interesting data as to cases of insanity having made complete recovery after dental attention had been given, usually the removal of badly impacted and unerupted or abscessed teeth.

Recognizing and calling attention to the need or impending need of orthodontia is vital. It is one of the big problems today confronting the profession, parents and school authorities of the fact that so few dentists care to treat orthodontic cases, and the nature of this specialty rendering it very expensive makes such treatment prohibitive to the poor. In our demonstration clinics in the rural districts we have this problem constantly before us—educating to the need of attention almost impossible to get.

The recognizing by the dentist, or the school nurse of adenoids and enlarged swollen, and diseased tonsils, and referring them to the physician or rhinologist is very important, as some of the most difficult cases to correct are those caused by these conditions being allowed to progress.

In organizing a dental department for the public schools the work is usually divided into three parts:

1. Educational: Consisting of class room lectures with aid of stereopticon or movies, and illustrated literature to take home to be read to or by the parents. Compositions and posters by the children also help to impress upon them the value of dental hygiene.

2. Preventive: Where the teeth receive prophylactic cleaning at regular intervals for the first few years at least. Here is where the dental nurse or prophylactician working under the supervision of the school dentist is invaluable. As yet I have heard no convincing argument against the employment of young women of good character properly trained and supervised in this most important work. By their sex are they also particularly qualified and adapted to the handling of children where men would fail many times in patience and thereby also efficiency. These young women become splendid in their zeal and enthusiasm over their work and can as social workers also carry some of this into the homes where men would again fail. They are the solution of part of our big problem of how to carry on the enormous

work of prophylaxis for all school and institutional children.

3. Reparative Clinic: Where all cavities are kept filled, abscessed teeth extracted, and general watch kept of all mouth conditions. This is usually only done for those children whose parents are unable to pay, and is either done free of charge or a small fee of 5 or 10 cents per sitting.

I do not believe in free clinics in the public or parochial schools as the "rendering of a valuable service to any child without compensation or return effort on their part. In other words giving something for nothing has a tendency to pauperize the parents as well as the child, and destroys self respect and prevents character building." It would seem as if every child should be allowed, yes even required to make some return in effort if unable to pay in money, so as to minimize this tendency. However, as we make progress along the first, and the most important phase the educational division of school, and pre-school dentistry, so will we gradually solve the reparative problem by eliminating the necessity for it. However, the ideal will be long in attaining, unless we as dentists organize into more concerted effort in the educational and preventive phase of our work.

The movies are the most effective and interesting way of getting oral hygiene education to the public, but where not available, a dentist may now secure slides at most any time through the American Dental Association. It is every dentist's duty to prepare himself for a possible invitation from some organization in his locality, to lecture on oral hygiene, and he should make his best endeavor to impress his audience with the importance of dental health and its relation to body health.

Let us all make every effort towards progress in our endeavor to prevent caries. Then will we feel more nearly as if we are doing our full duty as members of a learned and honorable profession, to relieve suffering humanity, with unselfish ministration.

PRESIDENT'S ADDRESS, AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

By FREDERICK F. MOLT, D.D.S., Chicago, Illinois

(Read before the American Society of Oral Surgery and Exodontists, Los Angeles, California, July 11-14, 1922)

I AM very deeply conscious of the honor of serving as your president. My faith in the need for and the future of such an organization as ours is so abiding that the opportunity to serve in any capacity in its development should be grasped by any one of us. It is to be regretted that it does not appeal to all in that light for it is surprisingly difficult to find many willing to give time and effort toward the essential committee work.

The fact of this particular meeting being held in the far west, of course, precluded the possibility of a large meeting but the unfortunate coincidence of the strike of railway workers served to make many of our members who had definitely planned on being present timid about attempting the trip, hence a very small attendance is to be expected. Perhaps this is due as well in some measure, to the financial depression from which we hope we are now recovering.

The work of many of the committees is in such a formative stage that no definite report can be given, but the work outlined if carried on should eventuate in much desirable added knowledge for all of us. In order to justify our existence as an organization, our programs should be not ultra-scientific, but sufficiently scientific to add not only to our mental development but to the profession's advancement. This means that our meetings must be in a great measure a forum for the consideration of old theories and the advancing of new. Every advancement is primarily theoretical, to be mulled over and tested out, discussed by those of favorable and unfavorable opinion and eventually accepted or rejected, not on the basis of expressed opinion but by its actual success or failure in practice. This means that every one of us of inventive mind or scientific thought must be willing and anxious to put forth his best, braving the possible criticism of his brother practitioners and having the value of his departure or advancement tested, not by one but by many.

We have criticized in dentistry the disinclination of any one who has worked out something of value to hand it over without thought of compensation to his brother practitioners. We can well take as an example the practitioners of surgery, who in their clinics give without stint whatever is new and acceptable, and not demean ourselves by trying to keep locked up in our own selves and practices some advanced procedure, to be doled out as though selling goods by the yard. There can on the other hand be no criticism of any post-graduate teaching by those competent, providing no secrecy is attempted as to methods taught; in other words, if you or I have something of value, any one of our brother specialists should be welcome to see it or hear it. This will avoid the criticism so often offered as to the commercialization of our profession.

There should be no time in our professional lives for petty jealousies. Let us save our energy for advancement. An honest difference of opinion should be no cause for ignoble enmities, for that we are all entitled to, and accomplishment is the final and determining test for all.

Success is to be measured as much in our service to mankind as in material accumulation, although unfortunately our professional viewpoint has become in a great measure prostituted to the opposite view. The matter of fees to be charged can safely be left to the discretion of most conscientious operators, for the man who "delivers" is usually sufficiently honest with both the patient and himself so that neither one will fare badly. Charlatanism, on the other hand or the obtaining of enormous fees though one may have given mediocre services or those of very little value, is to be condemned for the reaction upon the rest of the profession is harmful.

Unethical procedures, either in the way of fee splitting (condemned without qualification by our professional code), charlatanistic procedures or unprofessional action toward a brother practitioner have no place among our members, and no member should be reluctant to report another for such conduct.

Every candidate for membership should be so closely scanned that there will be no possible chance for criticism as to the selection or election of any member either on the letter or spirit of our constitution. We should, on the other hand, make a diligent effort to include in our membership every man who is eligible and desirable through his professional achievements. Above all, we should make all who are at present and who may become in the future members, workers and not onlookers.

Among the committees from which we look for reports of value either at this meeting or at the following one, are those on nomenclature, classification of impacted third molars and scientific research. It would be desirable, if no report is ready, to continue the membership of these committees with as little change as is possible.

At future meetings, it occurs to me, it will be of decided advantage to resume our collaboration with the National Society of Denture Prosthetists in joint meeting, and to broaden the scope of this inquiry into desirable operative results to include cases requiring small or extensive saddles of metal construction. It will be of value to have papers presented by orthodontists and pediadontists to clarify in our minds the procedures that we should follow with our small patients, for cases frequently present in which we are in a quandary.

Let us work together with the radiodontist for a similar viewpoint as to radiographic interpretation and stress this point in our society meetings for it is unfortunate that so much difference of opinion should exist as does on this subject.

The points of difference in local and general anesthetics should be touched upon by competent anesthetists and an effort made to differentiate between cases that require one or the other.

Pathologists, and able internists may profitably be called upon to teach us how closely allied we should be to the physician in the working out of systemic problems, and how we may ably co-operate; in other words how we may "talk the same language with understanding."

In conclusion, I would suggest that a knowledge of the primary and essential principles of surgical asepsis, both as to preparation of and care of instruments as well as of the operator himself would be of value to many of us, for as I stated recently in addressing an assistant's organization, if I had to choose in an assistant between cleanliness and godliness, I should surely choose cleanliness.

If many of the small points that each of us has worked out could be offered to the members of the society it would mean a more efficient group, I am sure.

Let us look forward therefore to a prosperous coming year and to future programs touching upon many of these suggestions, with the hope that much may be accomplished. Let us set our minds moreover to continued effort not only by the officers and committee members but by each one individually.

REPORT OF THE COUNCIL ON MOUTH HYGIENE AND PUBLIC INSTRUCTION ON THE PUBLIC HEALTH EXHIBIT AT THE LOS ANGELES MEETING

Forword

AT A MEETING of the above council held in Chicago, November 4-5, 1921, President Thomas B. Hartzell suggested that a great health exhibit be instituted this year which would be open to the public and the profession during the entire session.

This exhibit was planned to include every phase of dentistry, both professional and educational, that is related to public service, including school work and pre-school work, rural and community hygiene and health work, industrial work and the relation of dentistry to preventive medicine.

The members of the council present at this meeting agreed to support this new venture with their best effort.

The Exhibit

Space at the Ambassador Hotel would not permit of housing the exhibit within the hotel. The confusion resulting from a mingling of the public and the profession on the occasion of a big meeting also indicated the necessity for holding it in a separate near-by location. The first proposal made by the Committee on Local Arrangements was to furnish a large tent on the lawn or tennis courts, which plan, after some indecision was finally adopted and a tent 130 feet square was erected over the tennis courts with a concrete floor which, except for the influence of the wind on hung exhibits proved to be entirely satisfactory.

The Council on Mouth Hygiene and Public Instruction is greatly indebted to the Committee on Local Arrangements for their co-operation and maintenance in providing the tent and other facilities for this exhibit.

Space

Being square, the floor space in the tent was divided into exhibit space sixteen feet wide around the walls of the tent, then an aisle twelve feet wide and then a central area for rest and refreshment.

The exhibit space was allotted to exhibitors in terms of their requests and happily the entire area, 620 lineal feet by 16 feet in depth, was occupied except a distance of 60 feet which was reserved for motion picture purposes.

Representation

It is but fitting that the American Dental Association which sponsored this exhibit should be mentioned first among the exhibitors. Under the direction of Otto U. King an exhibit of lantern slides in an illustrated shadow box and reprints of lectures and papers dealing with preventive dentistry in its many aspects, was provided. It illustrated what the parent association is endeavoring to do in stimulating the states to carry on their own dental health education.

Nine states and one territory were represented in the exhibit, some of them by direct official action and some by a combination of exhibits. All the participants are to be congratulated on their sincere

effort to make this initial exhibit a success when distance and transportation conditions added materially to the cost and hazards of shipping.

Minnesota under the stimulus of President Hartzell, was one of the first states to plan its exhibit, the state dental association providing the funds and its members co-operating in the plan. This exhibit consisted of two parts, one a series of neatly designed easels, each carrying information of interest to all. It was divided into four sections—(1) pre-natal influence; (2) from birth to two years; (3) from two to six years; (4) from six to sixteen years.

A stereomotograph in continuous operation with legends, slogans and illustrations, occupied the central space in this exhibit. An especially commendable feature of this exhibit and designed to encourage other states to engage in public service in mouth hygiene and preventive dentistry; and two, a series of charts depicting various pathologic changes occurring as a result of infection with specimens of diseased organs in sealed jars and microscopic slides descriptive of these and other conditions on tables with various pieces of scientific apparatus.

Part one of this exhibit was under the personal direction of W. H. Card of Minneapolis assisted by W. P. Larson of Minneapolis.

Massachusetts was very well represented by two strong exhibits,—(1) under the direction of the Department of Oral Hygiene of the State Board of Health, Miss Evelyn C. Schmidt, director in charge; this was secured through the Massachusetts State Dental Society; and (2) the Forsyth Dental Infirmary under the personal direction of Harold De Witt Cross.

The state exhibit included a screen twenty-five feet long, carrying a number of photographs of clinics and dental hygiene activities, as well as graphs, statistical reports, and posters representative of the work of the department and of the schools. A stereomotograph with a series of slides operating continuously, supplied the action to hold the passing visitor's attention if necessary. An exhibit of models of mal-formed teeth and unhygienic conditions of the oral cavity which has been used for several years, being a part of the first exhibit work of the Massachusetts State Dental Society, and a table covered with the types of dietary constituents necessary to the maintenance of good health with legendary information, occupied the central foreground of the exhibit.

The Forsyth Dental Infirmary exhibit included sixty lineal feet of wall space ten feet high, which was wholly covered with photographs, charts and statistics, descriptive of the work this great institution is doing, and a table of cases containing interesting and instructive models. Notable features of this exhibit were large photographs illustrating the effect of dietary deficiencies on lower animals with comparative illustrations of children where dietary deficiency was known to have existed. This represents a part of the work of Percy R. Howe, which is attracting the attention of the medical and dental profession of both continents.

The statistical data supplied was of great value to those whose interests take them out into the field of public service where information and publicity is necessary to carry on the message.

New York placed a very complete and attractive informational exhibit under the direction of Abram Hoffman of Buffalo.

The Rochester Dental Dispensary, Harvey J. Burkhart, director, included its exhibit with the state. A very interesting series of photographs and a great deal of statistical data showed not only the extent of the work being done, but also the manner in which it is being done. Such data is very helpful to the dentist, dental hygienist, or public health nurse

who is interested in promoting a dental service in the community, county, or state.

An interesting feature of this exhibit was the collection of published works on mouth hygiene and preventive dentistry both in bound volumes and pamphlet form.

Mississippi is doing a very interesting piece of work in community and school mouth hygiene. This exhibit consisted of two hundred square feet of easel space which illustrated the methods being promulgated for the proper care of the mouth and teeth from the viewpoint of the dentist, the parents, the child, and the school service.

A number of posters designed by the school children under the direction of the school art department, indicated their interest in the subject. The most interesting feature of the exhibit was two photographs of groups of school children, where one hundred per cent of those attending the school were given proper hygienic and remedial dental service. One group included only colored children and one group only white children.

This exhibit was prepared under the personal direction of W. R. Wright, of Jackson, chairman of the council in charge of the public health exhibit.

Ohio, one of the first states to engage actively in the mouth hygiene movement in the schools, presented a very unique exhibit. Under the direction of E. L. Pettibone of Cleveland, a collection of photographs illustrative of the progress made in industrial dentistry in all parts of the United States and Canada was presented as a special feature.

Next to the child welfare problem, perhaps no field of dentistry presents a better opportunity for a great social service than the industrial field. This group is not only lacking in information concerning health as a rule, but so far as dental service is concerned they frequently receive that which is poor in quality or none at all. The health information disseminated through the industrial dental clinic is taken into the homes of the workers and put into practice there, so that the next generation is being informed.

Another interesting part of the Ohio exhibit was a clinical demonstration of the record and report system in use in the mouth hygiene division of the health work in the public schools of Cleveland. Those who were especially interested in this work received much valuable assistance from Dr. H. R. C. Wilson, of Cleveland, in charge. It was unfortunate that Dr. Wilson's clinic was not placed the first day of the session so that many others could have seen it.

Hawaii, encouraged by the recent activity in the establishment of a magnificent dental infirmary, the gift of Mrs. George R. Carter, of Honolulu, was represented by a series of twenty large photographs, illustrating the work that is being done, the place where it is being done, and statistical reports showing the extent of it, among both children and adults.

Under the direction of A. C. Braly, who had charge of the exhibit, the Honolulu Dental Infirmary will combine the philanthropic health service and training school for dental hygienists as carried on at the Forsyth Dental Infirmary, with the public school service and instruction by these hygienists as planned by A. C. Fones. This combination offers perhaps the best solution of the mouth hygiene problem today.

Michigan submitted through A. C. Thompson, of Detroit, a very instructive exhibit of posters, charts, maps and statistics, a very creditable display of their activities.

Pennsylvania and Louisiana were represented by graphic illustrations of the work being done by these respective states either officially or through the state dental societies. The large charts on exhibition gave a very good analysis of their policies and procedure.

The California exhibit consisted of a

combined demonstration presented by a number of exhibitors each of whom is deserving of special mention and credit.

The Division of Dental Hygiene, State Board of Health, Miss Charlotte Greenhood, supervisor, presented a booth representing a community scene showing the home, the school, the asylum, and the factory, with a query as to where and when mouth hygiene could be most profitably introduced.

A graphic distribution of the location of public dental clinics and like information on a map of California, was shown on the wall of the booth. In addition a display of the various types of equipment used in presenting the work of the division before various audiences, including models, charts, graphs, portable equipment, the toothbrush and its proper use, circulars of information and reprints were shown.

The difficult task of covering so large a territory by a single official, where a tremendous state wide interest in the dental health program is developing rapidly, was apparent in a study of this exhibit and the results accomplished as evidenced by reports and statistics were a credit to this new division and its supervisor.

The Los Angeles County Health Department, Dr. Pomeroy and Mrs. Durbin in charge, co-operating with the Junior Red Cross of that county, presented a novel exhibit. To demonstrate that special equipment is not necessary for a portable dental clinic, a Ford coupe with the essentials of a dental outfit was shown "Ready-to-Go" on ten minutes notice to any part of the county. Equally as novel was a miniature demonstration of "Spotless Town" and "Shanty Town" with the characteristic sanitary and insanitary features of each shown, public health activity being the dominant thought. The relative features of the two extremes in community life showed the great importance of the public health movement.

The dental hygienists of California, Miss Elma W. Platt, president, presented an exhibit of the activities of this association throughout the state and added to the attractiveness of it by having a living exhibit each afternoon with a group of small school children demonstrating the toothbrush drill. The interest of the children in this movement as compared to the children of a generation ago is a demonstration of the progress of the dental health program.

The Oral Hygiene section of the Los Angeles County Dental Society with an eleventh-hour notice prepared and furnished a well arranged plan of an ideal dental clinic, consisting of a reception room, business office, laboratory, general operating room, minor surgery and rest room. F. E. Hogebrom, assisted by one of the nurses in training from the Children's Hospital described the work being done in several communities in southern California where such clinics exist.

The California Dairy Council, Miss Huddlestone in charge, by charts, graphs and literature showed the relation existing between dependable dairy products and the growth of the child. Particular reference to the health of the mouth and teeth was illustrated.

The California State Dental Association, Guy S. Millberry in charge, assisted by Mr. Earl Pound and Miss N. A. Johnson, submitted a group demonstration of the activities of various counties.

Stimulated by the work of the educational committee of the association, during 1919-1921, several counties have developed a wide awake interest in public service. Contra Costa County is providing the service of a dental hygienist and of dentists at county expense, with a county wide interest in the plan.

Alameda County has co-ordinated the service of its public health center and its health work in schools by appointing a single director, Alvin Powell, to supervise both, and dentistry receives a very liberal

acknowledgment of its responsibility in the health campaign in that county.

San Francisco County showed statistical records of its activities and of its methods of presenting lectures and information before public audiences.

Fresno County showed the results of an intensive dental health campaign in the schools with reports of work done, prize posters, etc., an indication of county activity in this field.

San Joaquin County showed its memorial clinic in the city of Stockton known as the Hough Clinic, a result of the influence of an interested profession on a philanthropic citizen.

Mr. Hough's gifts to the city in this form have added much to the health of its children and aroused and maintained a keen interest in public dental service.

While the activities of California were apparently limited as demonstrated at the exhibit, the professional interest is gaining strength annually and one may say truthfully that the "dental health program is sold" in California.

The moving pictures presented consisted of films loaned by Otto U. King, The Forsyth Dental Infirmary, The National Mouth Hygiene Association, Weston A. Price, M. L. Rhein, Miss Charlotte Greenhood and the Atlas Educational Film Company. They were in continuous operation daily and presented many creative suggestions to the observers. This method of carrying on instruction in mouth hygiene will find its proper place in time and undoubtedly continue permanently to carry the message to the children.

Believing that an announcement of the relative merits of the several exhibits based on interest, attractiveness, and instructional value would be appreciated, the House of Delegates upon the recommendation of the trustees of the American Dental Association appointed a committee of three, F. O. Hetrick, chairman, to award the honors to the states holding the first, second and third places, based on the above values. Massachusetts was awarded first place, California second, and Minnesota third.

Management

The success of a dental public health exhibit is dependent on several factors. First, the management should be vested in a person in the community where the meeting is to be held, who shall be a member of the Local Arrangement Committee. He should be authorized to plan for space, decorations, service of all kinds, including water, gas, electricity, janitorial, and should be permitted to enter into contracts with responsible firms for such things far in advance of the meeting, so that eleventh-hour contracts and rush orders with overtime and no salvage will not add tremendously to the costs of exhibiting.

He should be authorized to solicit exhibits from educational and professional sources throughout the country and even abroad and to deal directly with such exhibitors from beginning to end.

He should be authorized to spend a certain sum of money for the purpose of providing facilities for such an exhibit, including housing, service, publicity, correspondence, etc., which may either be an appropriation from the trustees or an allocation of the funds by the Local Arrangements Committee. Whatever the source may be he should know from six to eight months in advance just how much money will be available for his use at the coming meeting. Only a certain portion, not to exceed seventy per cent, should be disposed of by contract prior to the meeting leaving at least thirty per cent for emergencies during the meeting. Agreements with exhibitors should provide that all expense of building, packing, transporting, insuring the exhibits should be borne by the exhibitor for as soon as the trustees of the American Dental Association or the Local Arrangements Committeeman agrees to pay any

portion of such expense the obligation will be impossible to determine and the responsibilities greater than either should bear. If an exhibit requires more than the ordinary service installation or an extraordinary volume of electric light or power or of water, such exhibitors should bear their quota of such extra expense.

Each state should be encouraged to bear its own burden in stimulating others to engage in this great work and to lead in promulgating a health program that will redound to the credit of the state and the nation.

The Commission on Mouth Hygiene and Public Instruction may render valuable assistance in helping to secure such an exhibit in the future but its interests are more legislative than executive and its members are widely distributed and cannot function except through correspondence, an unsatisfactory method when executive decisions must be rendered.

The Council of Mouth Hygiene and Public Instruction feels complimented by receiving many congratulatory expressions on the result of its first effort and is deeply appreciative of the sincere cooperation of all of the exhibitors to whom these congratulatory messages are due for the commission has merely served as an agency in carrying out the wishes of our esteemed president, Thomas B. Hartzell.

The Council also hoped that each succeeding effort will so far surpass this first one that the public health exhibits of the American Dental Association during its future meetings will be considered one of the most interesting and valuable features of any health associational activity in the United States.

A financial statement for the meeting of 1922 is appended.

Respectfully submitted,

W. R. Wright, *Chairman,*
E. L. Pettibone, *Vice-Chairman.*
Otto U. King, *Secretary,*
Guy S. Millberry,
H. J. Burkhart,

The Council on Mouth Hygiene and Public Instruction.

DENTAL CLINIC AT A COUNTY FAIR

By A. H. FINKE, D.D.S., Sheboygan, Wisconsin

A VERY interesting dental clinic was held this year at Sheboygan, Wisconsin, county fair under the direction of the county nurse, Miss Evelyn Smith, who is the representative of the Sheboygan County Anti-Tuberculosis Association and the Department of Public Health.

In her work about the district Miss Smith found many sad cases of neglect on the part of the children's teeth and wondered if there was not a way to spread the propaganda of health with reference to the teeth within reach of a great many people; knowing full well that if the mouths of the children would be cared for, many of their systemic troubles would be eliminated.

After much thought a plan was formulated whereby a clinic at the county fair grounds was held during fair week and we fell assured that the efforts were well worth while.

The Sheboygan County Dental Society gave what help they could in supplying the clinic with pictures and models showing cases of irregularities before and after correction, results of thumb-sucking, mal-eruption of teeth because of premature loss of the lower first molar, etc. The dentists were on duty at all times during fair week to examine and to advise free of charge.

The clinic itself was housed in a tent which held a collapsible dental chair, tables, chairs and cots. Placards were hung about the tent with sayings such as: "Sick—possibly your teeth are the cause," "Consult your mirror", "You are invited to ask these dentists questions", "Go smiling through life with a good set of teeth".

Thousands of pieces of literature pertaining to the care of the teeth were given away beside 3700 tubes of tooth paste. Instruction as to the use of the toothbrush was given and brushes were sold at five cents each. Everyone was told to draw from a fortune box as they entered the tent which held a line pertaining to the care of the teeth.

Several hundred children were examined and one child from each township was given free dental care by the dentist to whom he wished to go. This feature as a prize created a great deal of interest.

Miss Smith deserves credit for the success of the clinic. It was given entirely upon her own initiative and she is planning that with her experience the clinic next year will be both bigger and better. She will have the co-operation and assistance of our society.

OCCLUSAL TRAUMA

By DONALD F. MOSHER, D.D.S., Kansas City, Missouri

(Read before the Joint Meeting of the Missouri, Oklahoma and Kansas State Dental Societies, Kansas City, Missouri, April 10-15, 1922)

OF ALL diseases with which mankind is afflicted the most prevalent are those of the teeth and gums. Pathological conditions have always, to some extent, been present in the mouth, but while many other diseases have been diminished in frequency, mouth conditions seem to be growing worse, as evidenced by reports of the examination of school children all over the country.

The general subject of occlusion, and especially that part which relates to occlusal trauma is, in my opinion, one of the most important and interesting subjects confronting the dental profession today. When we stop to realize that the health, comfort, and retention of the dental organs may depend largely upon this important factor, we will serve our patients better.

I am not going into detail pertaining to the anatomical and pathological changes which may take place as the result of occlusal trauma, other than to say that it is a condition of abnormal stress brought on by an unnatural relationship of opposing teeth. In general, any condition contributing to the loss of normal function and changed relation of the teeth will result in occlusal trauma.

The positive force applied in occluding the teeth in the normal act of swallowing is an important factor that must be considered, as any deviation or change from the normal condition of stress of the teeth will be accentuated on account of this force and the frequency with which it occurs.

The principal methods used in the determination of occlusal trauma are tests for mobility, use of radiography, and the mounting of casts of the teeth upon an articulator, such as the Monson instrument.

Some manifestations of occlusal trauma are tenderness of the teeth to percussion, tipping and elongation of teeth, faulty restorations, variation from the normal in the gingival tissues, and changes as shown by radiograms. When a tooth is tender to percussion, the natural inference is that the tenderness is caused by occlusal trauma unless the pulp is involved. When a tooth is tipped, force is not exerted in a line with the long axis of the tooth and occlusal trauma results. If a tooth is elongated on account of the absence of an occluding tooth, or where there is a faulty restoration or a malocclusion, occlusal trauma may result because the normal line of force of the occluding teeth has been changed. The deviation of the inclined planes of opposing teeth from their normal relationship either by tipping, elongation, or any abnormal stress, results in a loss of the natural pink color of the gingival tissue, and a condition of stasis ensues which, if not corrected, results in the breaking down of the surrounding tissues. In the use of the radiogram, one may find as a result of occlusal trauma, a picture of a

rarefied area of the bone at the apex of a tooth, as well as a thickening of the periodontal membrane.

It has been stated that improper restorations are a frequent cause of occlusal trauma. This statement may be elaborated as follows:

1. Golds of great hardness are being used in restorations, such as abutments for bridges and in restoring the whole occlusal surfaces of badly broken down teeth. If, in making these restorations, the cusps are left too high or the planes placed in such a manner that the stress is diverted from its normal line of force, the tooth or teeth so restored are placed in a condition of constant occlusal shock. The hard golds do not flow under stress and wear down as was the case when softer golds were used.

2. The occlusal surfaces are too often improperly carved as to correct tooth form. The usual mistake is to leave the marginal ridges too high and without proper spillways as nature makes them to sluice away easily the masticated food. Also, they are often carved in such a manner that the points of the buccal and lingual cusps are directly over the buccal and lingual walls. In nature these walls slope toward each other to so great an extent that the distance from the points of the buccal cusps to the points of the lingual cusps is only one-half the width of the tooth at the widest part buccolingually. This puts twice as much stress on the tooth as it was meant to carry.

3. Contact points are placed improperly as to position and also sometimes made so full that the tooth is tipped somewhat mesially or distally, as the case may be, so that the planes are in abnormal relationship.

4. In setting bridges or inlays, considerable force is often used to get them into place. The teeth are intruded to a degree into their respective sockets and when a patient is asked to close, since the teeth are so intruded they do not feel that the restoration strikes unduly. After a period of rest, the teeth come back to their original normal position, and then certain portions of the restoration strikes too much with consequent trauma, particularly in swallowing. The plea is here made to have every patient, for whom a restoration is placed, return as a matter of routine on the day after such placing for examination with the disclosing paste and reduction of high points, if any exist. It is also a good plan to have the patient return at stated intervals to check up the restorations, both from a clinical and a radiographic standpoint.

5. Full mouth impressions should be taken in all cases of bridge-work, since the tactile sense of the cusps of the teeth is a real guide to occlusion. If we take impressions of one side only we have no idea as to how that patient really bites with a consequent great possibility of improper carving and resultant improper stress.

In the treatment of these conditions, I have found it an excellent plan to take an impression of the teeth and with the use of a mouth lamp with mirror attached, look for surface wear caused by excessive friction of one tooth upon another. This leaves a highly polished area which can be easily distinguished when the rays of light are projected from the right angle. By marking the findings on the cast a very simple and accurate record is obtained, which will be a guide in making corrections.

The teeth are suspended in fibrous tissues, allowing a certain amount of elasticity when stress is applied, therefore, in the use of carbon paper the loose teeth are depressed in their sockets and the markings show more distinctly on the teeth that are more firm. In addition there is usually shown a greater number of markings than you wish, on account of the force required to make an imprint from the paper.

I find the use of a disclosing paste is more accurate as it requires only the slightest contact of the teeth to make a

definite marking. This paste is made of lamp black incorporated with perfumed vaseline and was suggested to me by Dr. Frederick A. Brickner. Before using the paste, the tooth to be ground, as well as the opposing tooth, is thoroughly tried. With a small camel's hair brush the paste is applied on the occlusal surface of the opposing tooth, and then the patient is instructed to close ever so slightly, after which the occlusion is corrected with a carborundum stone. One should be careful to make corrections so that the occlusal stress will be as near as possible in line with the long axis of the tooth. Any great deviation from the normal relationship of the opposing teeth may result in the stimulation of the osteoclasts and be followed by disastrous results

Sometimes after correcting the occlusion better results are obtained with the posterior teeth by use of a splint, but with the anterior teeth I do not advocate its use on account of the thinness of the surrounding bone with a consequent lack of circulation and chance for recovery.

If the teeth on which a splint is to be used are loose and sore, an occlusal rest in a form of a cap can be utilized to relieve the stress and allow the teeth to assume a more normal socket relationship. The cap is made of No. 30 gauge nickel silver bent in a form of a staple and fitted so as to slip over the crown of an adjacent firm tooth. It may be reinforced by a little solder on the occlusal surface.

The cap is usually put on the tooth in the morning and worn all day. Of course, the patient will not be able to take any solid food during this time. After the cap has been removed the splint is inserted and worn until the loose tooth or teeth have become firmer. The splint, which is cast out of hard gold, is removable so can be taken off by the patient and cleaned. Both the splint and the cap are of simple construction and easily applied.

In addition to the correction of occlusal trauma, it is, of course, necessary to remove all source of irritation in the mouth. The patient is instructed in the use of the toothbrush so that the gums and mucosa will receive proper stimulation. After all, the greatest responsibility in the care of the mouth must of necessity rest with the patient.

I do not want to leave the impression with you that I think occlusal trauma is the only cause of pyorrhea, but in my practice I have found it a most important one. No doubt diet and elimination are also important factors; but it has been my observation that there is a local, exciting cause, which must be removed. I will go further and say providing a man were blessed with a perfect body, lived a normal life, with no excesses either as to work or play, ate a balanced diet, had perfect elimination, and took reasonable care of his teeth, he might not develop any pathological conditions in his mouth. However, we must meet conditions as we find them today. From the patient's viewpoint, I should say that he is more interested in results rather than the way they are obtained. From the dentist's standpoint, quoting the Rotary Club's slogan, I should say: "He profits most who serves best."

PUBLIC HEALTH SERVICE.—AN APPEAL FOR MORE EFFECTIVE ORGANIZATION AND STANDARDIZATION

By EDWIN N. KENT, D.M.D., Boston, Massachusetts

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

THE mouth hygiene problem, as it faces the American Dental Association, is a national issue. The answer to the great question which we as a body should consider, is assisted, but not decided, by reports or exhibits from various localities demonstrating their individual accomplishments or by personal theories on educational or operative procedure.

These items should be a part of our program, obviously, but the logical end and aim of our deliberations is the national extermination of the most prevalent of all human diseases.

There are certain facts that we cannot escape. The present prevalence of dental caries is the blackest blot on the history of medical achievement and the burden of responsibility rests squarely upon our shoulders. No other group of scientists can reasonably be expected to share even a portion of our burden. Wherever the trail may lead it is ours to follow to the end and we are falling short of our duty if we leave a spot on the trail unexplored.

There is no other single disease in the entire field of pathology that has received the attention of so large a group of specialists. In this country, where dentistry is supposed to have reached its highest development, there are more than forty thousand individuals educated and delegated to solve the problem. This highly specialized force of workers, which has not varied much during the past ten years in relative size compared to population, has concentrated intensively on this one pathological enigma. With what effect?

We are justifiably proud of the wonderful products of mechanical and artistic ingenuity that have been brought forth to repair or replace lost human tissue. Mechanically and artistically we have "made good." But is this not about all? Have we made material progress in the real solution of the problem?

Is it not a fact that today approximately ninety-five per cent of our school children are afflicted with dental caries just as they were ten years ago? Is it not a fact that we have succeeded, during the past decade, in increasing the daily use of the toothbrush to an extent equal to only about two per cent of our population? Is it not a fact that, after these years of study, we are still unable to offer anything definite in dietetic instruction to assure the building of sound, healthy teeth?

Whether or not we may accept the evidence of statistics which seem to substantiate these statements, the following proposition cannot be questioned. The dental profession in this country is, as a whole, following at the heels of the enemy, satisfied for the most part in rebuilding the towns he has sacked. No offensive force has yet been organized which has been strong enough to meet the invading horde and effectively retard its progress. And this, I would respectfully

submit as the most important question that faces the American Dental Association today.

Without meeting this issue nationally; without concerted national action; without a broad, comprehensive, national effort to solve the problem there can be no reasonable promise of far-reaching effect. I thoroughly appreciate the attempts that have been made in the past to analyze and answer this problem nationally and I surely have no criticism to offer on the methods employed. We are only interested in the factors that now influence our study of the question and the suggestions presented in this paper are based on my conception of the situation facing us today; as follows:

1. Under existing conditions, pending more positive conclusions on diet and nutrition, our public health work must be centered on the extension of education emphasizing the importance of mouth cleanliness and on the establishment of dental infirmaries.

2. The solution of the problem in these two fields is at present being attempted by hundreds of individuals and separated groups of public spirited citizens, each single unit pursuing a course of expensive, experimental development.

3. There is, under this system (or lack of system), an inconsistent and unnecessary waste of labor and funds; there is hardly a movement in any community that is accomplishing maximum results at minimum expense, and we, as a specially delegated group of scientists, in ignoring this dissipation of energy and money, and failing to organize a standardized program of public health procedure, are not developing our highest efficiency.

And this brings me to the gist of the message I would deliver to you in this paper. I believe that the national solution of the great problem that faces us may be briefly expressed in two words—organization and standardization. We will consider these two items in reverse order.

It would seem, in these days of big business, unnecessary to emphasize the value of standardization. The fact that it is not in evidence in the field of public health would indicate that its value in that particular connection is either ignored or questioned.

I made my first public appeal for the adoption of standards in mouth hygiene educational service in a paper presented at the Fourth International Congress on School Hygiene at Buffalo in 1913, and in submitting my argument for standardization, I will quote somewhat from that paper and my yearly reports as president of the Dental Hygiene Council of Massachusetts, mainly to emphasize the fact that we are facing the same situation today that we faced ten years ago.

Following my address at Buffalo, I directed the organization and maintenance of the department of extension lectures under the National Mouth Hygiene Association, which was instituted mainly to test the practicability of my scheme for a standardized lecture service.

As this educational item practically illustrates the general subject I will describe its development at some length, though many of you are acquainted with its details if not its results.

My general theory was that there is but one story to tell and one best way to tell it to a given type of audience; that an ideal lecture for any type of audience must be interesting, impressive and authentic; that it should not express any one-man ideas but the carefully determined consensus of expert opinion; that a series of lectures could be constructed through the co-operation of medical and educational specialties covering the subject in more effective form than that which any one man could possibly conceive or execute; that the finished products, appropriately illustrated with lantern slides, could be issued for the use of physicians, dentists, public health nurses and others who were fitted to present the subject before public audiences,

thereby saving many hours of individual research and labor.

I delievered the first lecture of the series before the Dental Hygiene Council of Massachusetts, two dental societies, and audiences of school physicians, school teachers and school nurses, for the special purpose of promoting discussion and criticism that would suggest changes for improvement. Manuscript copies were subsequently edited by many other medical and educational authorities.

When finally issued it was recommended as a standardized lecture on the "Care and Use of the Human Mouth", and although the financial condition of the association made it necessary for this department to be self-supporting which required a rental fee for the use of manuscript and slides and a sale price that would permit a profit, this first experimental, standardized educational item reached, at a conservative estimate, more than two million auditors, was translated into several languages, is being used today by many of our own state and municipal health departments, dental societies and other organizations and individuals and has successfully proved the reasonableness of the theory advanced.

There is an insistent demand, not only for a continuance of this service (which has, through force of circumstances, been abandoned), but for its extension into broader fields. The scheme, as demonstrated, in the first steps of its infancy reached more people with effective instruction on the whole subject of mouth hygiene than any single educational item that has ever been issued before or since, and yet its possible field of development was touched on the surface only. I will offer a suggestive illustration of one of the possibilities in the extension of such a service.

Several months ago I addressed a letter to the school children of Massachusetts from the State Health Department. It was framed in juvenile terms and carried, in short form, the story of mouth hygiene and a paternal appeal for mouth cleanliness that would meet the requirements of the child mind. Copies were furnished to local school departments, most of whom were quite willing to cooperate, one being supplied for each school building, and the letter read to each class by the school teacher. Compare the simplicity of such a scheme with the difficulties of organizing a corps of lecturers to meet these six hundred thousand auditors. And a like letter addressed to "The American School Children" could be carried to twenty millions with no added complications other than a clerical force sufficient to handle the machinery of a simple and somewhat automatic system.

The presentation of our subject from the public platform is, however, but one small branch of the service demanded of us. All forms of educational literature should be standardized. There is a continual and ever increasing need for this material and it should always be constructed to represent the consensus of opinion.

As I have stated in a recently published paper: "We sit in session at dental society meetings and receive from the lips of numerous theorists, numerous theories. It is quite fitting and consistent that we should hear all sides of the story—all evidence in the case. But the public should never hear any expression other than the verdict. And the verdict represents our expression of standardization."

I believe that any piece of literature issued for public instruction dealing with any phase of the public health problem, is a very serious document. No one would attempt to defend a system of public health education sanctioning the issue of contradictory items of instruction and no one can deny that this situation exists in hundreds of cases. In each case the writer presents *his* individual theory or belief, but neither *his* theory, nor *your* theory, nor *my* theory can consistently be considered as possessing decisive weight.

The foregoing does not begin to touch the needs of standardization in the educational field but it is not the purpose of this paper to go far into detail.

What of the operative field? The public clinic is a comparatively young institution. How many there may be in this country at the present time no one knows as we have no national organization to compile statistics.

One of my first moves in organizing the mouth hygiene work in the Massachusetts State Health Department was the registration of all dental infirmaries or other movements for philanthropic dental service operating in the state. At that time (April, 1919) there were approximately fifty; at present we have recorded about one hundred. Not only is this work increasing in Massachusetts; we know that it is extending rapidly everywhere.

These important health institutions, with very few exceptions, are being conceived, organized and managed by inexperienced individuals, dentists and others, who are taking their first experimental steps in a new field.

It would probably be hard to find a representative of "big business" who would not condemn such a method as an unnecessary gamble against great odds. It seems to be the generally accepted theory that the situation is unfortunate, but unavoidable. I believe that it is *not* unavoidable.

The average dental clinic is organized by a small group (rarely more than ten per cent) of the dentists in a given community, working in conjunction with a women's club or some other lay organization interested in social service.

They meet in joint conference and committees are appointed to study and arrange details. Finally, after much research, a more or less definite plan is adopted and they approach the school committee and board of health with an argument based on the personal opinion of a group of individuals who have hastily studied and attempted the solution of a problem they have never before seriously considered. The "powers-that-be," after several weeks of deliberation, accept the proposition reluctantly, possibly with a little financial aid, more probably with permission only for the establishment of the proposed institution in one of the public schools. Some sort of an examination of the teeth of the school children seems to be the proper thing and this is proceeded with, sometimes with no definite object in view, usually with no comprehensively arranged system.

The selection of the clinic equipment is next in order and this is found to be not the least of the difficulties as the proper equipment for a dental clinic is quite unlike that of a private office, though this fact is seldom discovered until the work is well under way. After several weeks of tiresome effort on the part of the few willing workers the clinic opens for business.

Perhaps not until then is it discovered that special rules of operative procedure should be adopted which are again unlike those which govern the practitioner in private practice.

Finally, however, we will suppose that, in an exceptional case, after many failures, many changes of plans, many months of hard labor and experiment, the institution develops into an efficient stage, delivering maximum production at minimum expense, with a system that runs like clock work. It has required at least six months to develop the idea to its present point of efficiency. It would not take as many days for the same group of individuals to establish another clinic just like it, on the same efficient plane, with no necessary expensive development or experiment. This, in simple illustrative terms, expresses the basis of reasoning which has brought me to the conclusion that there is a very evident demand for the standardized dental clinic.

The standardization of the dental clinic is not a complicated procedure. It simply means the adoption of definite

or standard rules of organization, equipment, operative procedure and general management applicable to the various types of institutions demanded, such rules being formulated, not from the narrow viewpoints of a small group of men, but after careful study of all available data, investigation and research covering the factors of influence in connection with successful and unsuccessful institutions.

This is, perhaps, a sufficient suggestive argument on the principles of standardization. To be effective it must be extended nationally.

We have made some progress in the direction of standardization in our work in Massachusetts but it is obvious that its value always will be in direct proportion to the size of the representation which we accept as the authoritative voice and this means that it can never be completely worked out within the narrow limits of Massachausetts, or New York, or California.

The first article in the first issue of *Oral Hygiene* published in January,1911, from the pen of the late George Edwin Hunt was entitled "What Is the Best Way," and the author quite reasonably presents the following question: "We have been seeking the answer for more than ten years. Can anyone say that we have found it?"

Now, in 1922, with due regard for all the altruistic labor of our unselfish workers during the eleven years that have elapsed, may I be bold enough to answer "We have not." We have not found the best way. We are still floundering in the mire of uncertainty. We are still dealing with an unsolved problem.

I have presented what I conceive to be at least fifty per cent of the ultimate answer. There remains the other half—the question of organization. My conception of a national organization of our forces that will meet the demands of the hour is based on the following theorem:

1. It must constitute a concerted movement, representing the collective sentiment of the dental profession and should be sponsored by the American Dental Association.

2. It should be directed or headed by a central organization, acting as a clearing house, where the general problem and all of its ramifications may be practically dealt with.

3. This central bureau, or parent organization, should be under the management of a carefully selected director, a good organizer, with executive ability and broad vision, these characteristics being of greater importance than his scientific knowledge of medicine. Such a man, if he is selected from the dental profession, could, obviously, only be found among our most successful practitioners and he should receive ample remuneration to preclude the requirement of personal financial sacrifice. Certainly his economic value to the country would be much greater than that of any practitioner in private practice.

As there is always some uncertainty attendant upon such a public service appointment it might be necessary to accept a director on part time basis who would be unwilling to entirely relinquish his practice.

4. The director should be backed by a paid clerical force sufficient to maintain the detail work of his department. Willing workers will always be available for assistance in all sections of the country but the main organization, to promise success, must not be built on the flimsy foundation of volunteer service.

5. An advisory committee of specialists should be appointed to decide upon important matters and check up the activities of the organization but the director or manager should be unencumbered by that intricate executive mechanism too often in evidence in connection with public movements, which is being rapidly cleared from the field of big commercial enterprises.

6. The work cannot be financed by the dental profession and there is no reason why it should. There are several national public service institutions at

the present time seeking a way to spend money effectively in this field.

Conditions of today are not those of yesterday. Ten years ago the big organizations interested in public health needed argument to convince them of the importance of mouth hygiene. Today they are not asking *why* the mouth deserves attention. They are asking *how* it shall be given the attention it deserves. They are willing to co-operate.

They are anxious to know "What is the best way", and, when it is presented, they will be found amply able and willing to finance it.

7. A logically developed movement, built along practical lines on a solid national foundation, will have the co-operation of state and municipal health departments for the very simple reason that it meets their selfish needs. Place at the disposal of public health officials a national information bureau, able to furnish them with authoritative advice on the most practical methods of dealing with the problems in the mouth hygiene field and they could hardly pursue an independent program of research and experiment and justify themselves to the satisfaction of their departments of ways and means or their constituency.

The production of the proposed organization would come mainly under five heads:

1. A series of standardized lectures, with appropriate lantern slides, constructed to conform to our present knowledge and carefully kept up to date, setting forth the subject in the various forms necessary to meet the demands of audiences of average adults, special classes of adults, upper grade school children, kindergarten pupils, teachers and normal school students, physicians, dentists, nurses and other special groups.

2. Comprehensive standardized literature, likewise varied in form to cover all special educational fields, the printed matter sold or manuscript furnished for copy, or both.

3. Standardized exhibit material, furnished by the organization, or through the organization, but in any event determined by careful analysis of past experiments and present exhibits to be most effective for demonstration purposes.

4. Authoritative information representing the consensus of opinion backed by practical experience as well as theory on the organization and maintenance of dental infirmaries and other movements for philanthropic dental service to meet the needs of varying types of communities, financial and other conditions.

This would involve an elaborate and far reaching standardization of equipment and operative procedure.

5. Authentic statistics on all phases of the work determined by exhaustive analysis of past and present movements, research on the physical and economical effects of mouth disease and in many other fields of investigation.

There is no reason why the work of the proposed organization should be limited to the items stated, though it is probable that under these five heads will be found our fields of greatest needs. Individuals, organizations and communities are calling for helpful, authoritative council and effective ammunition. It is not difficult to furnish the material that is most needed to give the mouth hygiene movement broad extension. Not interest, nor enthusiasm, nor even finance is needed to assure strong offensive action against the most prevalent of all human diseases. These items are now available.

The key note is *system*. System, extended through combination, abolishing the wasteful experimental effort of isolated groups and bringing about a concerted movement along the most direct path to the desired end has been responsible for every great commercial advancement since the dawn of our era of big business. It is as applicable and as necessary in the public health field as in the realm of commerce, and it will produce the same results.

SUCCESS

By CARL V. CASSEL, College of Dentistry, University of Minnesota, 1922

LIFE is largely an expression of ourselves, of the ideals we cherish, and the will we possess to activate these ideals in our daily work and intercourse. Our ideals and our will, in turn, are the products of our thinking, and after all, the plane and direction of our thinking are the "lengthening shadows" of all the influences that have been brought to bear in our lives. We are, in a sense, the creatures of our environment, of our training—mental, physical, and spiritual. And so, whether we recognize the fact or not, we measure the world and our relation to it by a process of individual analysis which is always peculiarly our own, no matter how it may be tempered and qualified by the relations we sustain to the world about us. In this way we develop an attitude toward life, and of course there are as many such attitudes as there are human beings. We would not have it otherwise.

However, by a similarity of viewpoints in essential things, mankind becomes associated into groups, and the ascendance of one group or another determines at any given time and place, the predominating viewpoint of society at large. Also, these viewpoints necessarily change from period to period and may be quickly altered at times by the stir of great events or the influence of great personalities.

This shifting of viewpoints is well known in the varying estimates people place upon that rather intangible phenomenon we choose to call success. There was a time in the age of the world when success in life was measured in terms of brute force, enlarging as time progressed and the organization of society advanced, to mean whatever degree a man might attain of military leadership and conquest. There have been periods in history when mere scholastic attainment, spiritual leadership, or political ascendency were criteria of judgment. And as we live today in a world which is largely a "complex" of the past, we find as we should expect, that society today reflects in a measure the viewpoints of the society of yesterday and tempers them with the impressions it has garnered from its own experiences.

The interpretation given success today is wide and varied. There is the view, for instance, that success in life means the gathering of riches—the possession of money and property. Perhaps it is true that this is the most prevalent interpretation. In other instances, the goal desired is the possession of power and influence, political or social, or both. Also, men and women aspire to be great artists, great scientists—to be heralded and acclaimed as leaders in their chosen field of endeavor. Now, all these may be good, and on the other hand they may be bad, for it is the use of these attainments which really matters, and whether they are viewed as means to an end or as an end in themselves.

If, in the attainment of any goal, one's life has grown richer in the process, and one has contributed something to the real wealth and well-being of the world, then that life has been one of real attainment. It is possible, however, to achieve success even though riches, as we commonly

know them, slip by the door, though political and social power are not attained; for after all, to really succeed is to achieve worthily a worthy goal.

It seems to me that really successful men in all vocations, the world over, have been and continue to be, men who possess and activate high ideals, and that to in any measure, emulate them and to achieve as they have achieved, one must live one's own life worthily, of itself; achieve to the utmost in one's calling, whatever it may be; contribute something of one's own to the social good.

The first of these qualifications or requirements is usually an index to the other two, because we cannot entirely divorce ourselves from the work we do and the relations we sustain to others. The ideals we cherish reflect themselves not only in our individual conduct but "carry over" into the work we do and the relation of that work to the work of the world. The second consideration is important because we derive scant satisfaction in life unless we enjoy our daily allotted tasks, and we can find no real enjoyment there unless we strive constantly to do these tasks better. There is no vocation, however humble, that cannot be made a fine art, if we will it. But merely living for oneself alone and developing oneself to the highest skill and proficiency in work will not bring the full fruition of success. That is attained only when one's life and work have contributed, in whatever humble a measure it may be, something worth while to humanity, and unless somehow or other—whether in obscurity or amid the plaudits of one's fellows—one has been able to leave the world a little better and mankind a little happier for his having lived.

These considerations are surely applicable to success in dentistry. To say that the dentist is successful just in the measure that he is efficient covers the same ground, provided that we interpret efficiency in its broad and inclusive sense and do not restrict it merely to efficiency in dentistry, important as that may be.

From that angle it is apparent that the dentist must first of all be personally efficient. This is the very hub of the problem and really goes far in determining all else. Consider the matter of physical efficiency for instance. While it is true that men in poor health have accomplished great things, there is no gainsaying the fact that given the same qualifications they otherwise possessed, plus strong physiques, their accomplishments would have been greater. The dentist to be really efficient and therefore successful, needs to safeguard and develop his physical resources, by intelligent regard for his diet and exercise, and by maintaining the proper balance between work, recreation, and sleep.

He must also be mentally efficient, implying not only that he has attained to a certain degree of knowledge at school and college, but also, and perhaps more important, that this training has given him a vision which views the world through broad vistas, and that it has born in him the desire to constantly broaden and strengthen that vision in his reading and his social intercourse. Quite apart then from technical knowledge, which is very essential, he should grow constantly in the reaches of his thought life.

But there is still another angle to the personal efficiency problem, and that is the moral, the spiritual angle. We may differ, somewhat in our theologies, or we may have no definite theology at all. Nevertheless we can hardly escape the deep personal consciousness that there is within us a force, which moves in a different plane than mind and body, and which is related to a supreme power. I choose to call that power God, and others will call it whatever their faith or belief or conscience dictates. But whatever our nomenclature or interpretation, it remains true that to really attain to the full limit of one's inherent capacities, it is essential to establish oneself in relation

to that force and to strive to live by its rules of moral conduct; not because it helps business even though it will do that, but because it is essential to our own well being. We should arrive, according to our training, experiences, and inherent consciences, at a religion of life. We shall find too, that our lives will be enriched just in the measure that our religion of life is worthy and in the degree that we are able to live it.

Dentistry is our chosen life vocation so we must of course be efficient dentists, and to be a really efficient dentist today requires far more of a man than it did, even a decade or so ago. Being an efficient dentist not so very long ago meant, principally, it seems, that one should be skilled in the mechanical or otherwise purely technical phases of dentistry. If one could produce a beautiful or exact piece of restorative work, the requirement seemed to have been met. It is still true that the efficient dentist strives always to produce the beautiful, the exact, the substantially permanent piece of work. But our views of what constitutes beauty, usefulness and permanency have broadened. We have gone still further, for we have forsaken the viewpoint that the dentist's problem is merely the fixing of teeth or the replacing of teeth in some form or other.

The dental profession is arriving at its full stature. Today the intelligent, responsible, efficient dentist looks upon the teeth not as so many distinct, separate, and unrelated pieces of anatomy, but rather as functioning units related to general body functions. The human mouth ceases to be for him just a "hole" in which are so many teeth needing attention. The entire oral cavity, related so vitally as it is to the health and well being of the body, yawns as it were, as his newer and larger problem. And because it presents a larger problem, so it presents a greater responsibilty and a sterner challenge.

That, in general terms, constitutes the new, larger field of dentistry, and it challenges the ideals and resourcefulness of the best of men. We will be successful as dentists just in the measure that we accept our new responsibility seriously and discharge it earnestly. We must "see the gleam" and render service accordingly. In the purely restorative phases of our work we need to inquire not only whether we have made a restoration with esthetic, anatomical or artistic exactness—important as these truly are; but we must go beyond that. The teeth with their investing and supporting tissues have certain well established functions in the physiology and hygiene of the body. It is our business to preserve that hygiene and function by prevention where we can, to arrest their loss where it has started, and to restore them in whatever measure possible, when they have been lost.

A detailed discussion of how to accomplish these things would require several essays the length of this and, moreover, I do not pretend to know the best way to accomplish them. The important thing is that the successful dentist of today, and more truly the successful dentist of tomorrow is he, who in the practice of his profession adopts it as his practical working ideal that his business in life is to preserve, restore, or maintain the health and happiness of his patients to the fullest extent that lies within his province. Speaking generally, he can accomplish this by judicious diagnosis, skilful restoration, by the practice of preventive measures, and by educating the people who come to him for professional service, along the lines of oral hygiene.

It is perhaps in the matter of prevention and education that the newest enlargement of our field of service lies. We have been in the past, and are today, much interested in extension for prevention. We might well adopt today the slogan, "prevention for extension", for extension of life and happiness through healthier and better functioning oral cavities. To accomplish this end it is not sufficient that we practice and preach pre-

vention and oral hygiene in our offices. The gospel must be carried afield in a general movement of education. The really efficient dentist, alive to the responsibilities of his calling, lends his efforts readily in that direction. It is well also to remember in this connection that our greatest hope lies with the children. The child of today is the adult of tomorrow, and as it is far easier and better to form character than to reform it, so it is easier, more permanent and far-reaching to form in the children the habits of oral hygiene than it is to develop or correct the results of their lack in adults.

We said at the outset that success in life implied contributing something of one's own to the social good, in other words, that one be socially efficient. It is true that we contribute to the social well-being in the measure that we add to human welfare and happiness in the daily service of our offices. A dentist must give his concentrated attention to his work if he is to perfect himself in it. That is probably true also of the lawyer and the business man, for instance, but their work carries them more naturally by training and experience, into closer touch with community affairs. The dentist, involved in very specialized work and having received very specialized training, finds that it requires somewhat conscious, deliberate effort on his part to interest himself actively in such matters, or to prepare himself for such participation.

People are, more and more, coming to expect that professional men give of their time and trained capacities to the general social welfare, and the dentist can no more escape this requirement than can the physician, lawyer and business man. As an educated man or woman, the dentist must share in the responsibility of leadership in the social, political, and economic world. In order to do this, he must train and equip himself as a successful unit of society, must prepare to function in some phase of social welfare and contribute, in addition to his professional services, something to the social weal.

Success, after all, is a matter of degree of attainment, and we each one of us interpret that degree according to our own attitudes and viewpoints. We judge our personal success by the sense we experience of having attained to what we desired, or of having approximated, as best we could, that attainment. If the ideals we set out to activate and the work that we do are worthy, and we feel that we are doing our utmost, then we are not living in vain, but enriching our own lives and bound also to enrich the lives of others.

The world is not so hostile to ideals nor so inappreciative of thorough-going human service as it may sometimes appear. In its own way and time, it compensates the individual for whatever he really contributes. We may or we may not, in the course of a life time, achieve riches or social, political, or even professional prominence. Whether these are a part of our compensation or not, the real compensations of life are intangible things. The real rewards are to be found in the friendships we have been able to form, the respect inspired, and happiness attained, on the road of life and human service. If we live our lives worthily, do our work conscientiously, and add our quota of contribution to the common happiness, we shall know success in illuminated figures and find all along the way "a rich reward of unexpected things."

HEALTH CENTERS OF THE MASSACHUSETTS-HALIFAX HEALTH COMMISSION[1]

WITH SPECIAL REFERENCE TO PRESCHOOL-AGE DENTAL CLINICS AND NUTRITION CLASSES

By B. FRANKLIN ROYER, M.D., Executive Officer, Massachusetts-Halifax Health Commission, Halifax, N. S.

(Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Third Annual Session of the American Medical Association, St. Louis, Missouri, May, 1922)

HEALTH center work in Halifax and Dartmouth came about as a direct result of the ship disaster occurring in Halifax harbor, December 6, 1917, when the Mont Blanc and the Imo collided. The Mont Blanc was loaded with trinitrotoluene, and a great explosion resulted, destroying the lives of 1,635 citizens, and wrecking several thousand dwelling houses. Practically all buildings in the two communities were severely damaged, the property loss alone amounting to $30,000,000. Immediately after the news reached Boston, citizens of Massachusetts hurried physicians and nurses to Halifax with relief and supplies. A very generous contribution of funds and supplies followed, the collection reaching almost $750,000. In addition, several shiploads and several trainloads of supplies and the personal assistance of many citizens of Massachusetts were contributed. As soon as the governments of Canada and England could visualize the disaster, and make plans to give permanent relief, a commission was formed to handle relief in an official way and pay for all loss of life, limb and property.

With the formation of the government organization, and its establishment on the ground, outside philanthropy was no longer needed. A quarter of a million dollars of the Massachusetts money remained unexpended at this time, and at the suggestion of the committee in Massachusetts, Dr. Victor G. Heiser studied local needs to determine how this large balance might be expended within the spirit of the donations, and for a need having some direct relation to the disaster. Dr. Heiser recommended that the money be employed in a campaign of public health education and preventive medicine, on condition that the government relief commission supplement it at the rate of $15,000 a year for a period of five years, and that the city of Halifax and the province of Nova Scotia each make contributions in facilities or money to the sum of $5,000 a year, the Massachusetts money to be apportioned as needed over approximately a five-year period. This was agreed to by all organizations, and a new commission, known as the Massachusetts-Halifax Health Commission, was created under a special act of the Nova Scotia legislature in May, 1919.

Dr. Heiser recommended the establishment of health centers as a part of the

[1] *Jour. Amer. Med. Assoc.*, October 14, 1922.

constructive educational health campaign. It has been my privilege to work out on the grounds the details of this supplemental health program in co-operation with the chief nurse of the commission, subject, of course, to the approval of the commission itself.

The child welfare clinics, the prenatal clinics, the ear, nose and throat services, the posture clinics, the venereal clinics and the tuberculosis services are organized very much along the lines now obtaining in the best health centers in other parts of the United States. Some medical service is given and much public health counsel is offered both by physicians and by dentists, as well as by specially trained public health nurses and nutrition workers.

Some new features, however, have been introduced in the preschool-age dental clinics, and in the nutrition clinics, that are worthy of special discussion at this time.

In making preliminary plans for a preschool-age dental clinic, we first submitted our views to the Halifax Dental Society. The Dental Committee on Public Health of this society agreed to the suggestion that the proper place for, and the place most likely to give results in, preventive dentistry was in the preschool-age group, that is, up to 6 years. This committee agreed also with my suggestion that tooth nourishment should be featured out of all proportion to what has been done in health work in other places, and that prophylactic dentistry should be practiced in co-operation with such an instructional service. While the matter was under discussion, a subcommittee secured approval of the Canadian Dental Society, and a delegate secured approval of the American Dental Association.

It is the teaching plan of these health center preschool-age dental clinics to begin featuring tooth nourishment in the prenatal period. We try to make the expectant mother appreciate that unless she takes food from which sound bone and good teeth may be built, her baby will not grow a sound, strong, well-enameled set of temporary teeth, likely to remain sound and free from decay during the period of their natural use. We teach the mother to appreciate that the first set of teeth, even to the enamel, is pretty well finished when the child is born, although the teeth are under the gums in the jaw. We preach the use of liberal quantities of whole milk, the use of all leafy vegetables, even to raw cabbage, especially during the last six months of pregnancy. We aim to have the dentist in charge of this service advise with expectant mothers and the public health nurses, as well as the physician in this prenatal service and nursing period.

We begin dentistry with the baby at 6 months, whether bottle-fed or breast-fed, and try to control the health of the baby from then until he is 6 years of age, by taking him to the preschool-age dental clinic for guidance, and to impress on the mother essential food lessons. The dentist in the clinic, and the public health nurse subsequently in the home, constantly keep before the mother the thought that, in this important period, the second teeth are being built and enameled. We urge that, unless the child is given through these years also the kind of food from which sound teeth may be built, the permanent teeth may decay at any time after complete eruption or in the early teens. We teach continuously and constantly that unless the right kind of food is taken—chiefly mother's milk the first year, and modified milk or good whole milk later and as soon as possible, leafy vegetables, oatmeal porridge and whole wheat bread—one cannot lay the foundation for strong teeth or good lasting enamel. We emphasize in the clinic and through the health nurse and visiting housekeeper that tooth-feeding is of greater value than tooth-cleansing, but, at the same time, we teach oral hygiene.

The dentist teaches the use of the toothbrush in prophylactic work, and mechanically cleanses when necessary. With children coming to the clinic who have

been improperly fed and whose mouths have been neglected, much repair work naturally is done, the sort dentists refer to as patchwork. Silver may be deposited by precipitation, both in shallow cavities that have been previously cleaned, and as a coating to teeth losing their enamel, with the hope of preserving them and keeping their value in the development of the jaw. Fillings may otherwise be put in. Sinuses and diseased gums are treated.

The whole of this dental clinic service, however, is educational rather than reparative. We teach that tooth-feeding must begin with the expectant mother and must be continued during the prenatal period. One of our slogans is: "A sanitary mouth with good oral habits at 6 is likely to remain a clean, healthy mouth at 60." We are fortunate in having a woman dentist, Dr. Arabelle Mackenzie, who has had a year of postgraduate training in the Forsythe Clinic at Boston. She is tactful in handling children, and fits in well in co-ordinating her work with that of the medical staff. We have given her the title of pedodontist. She now has more than 300 babies and children less than 6 years of age coming to this clinic four times a year for dental advice. The nurse during the latter half of the first year visits the baby fortnightly, and once a month, or oftener if required, during the entire preschool period.

The school dentists of Halifax have already voluntarily made special report to the school authorities of the notable changes observed by them in children entering school during the last session, who have had from one year to eighteen months in the preschool dental clinic.

The nutrition services of the health center are organized much along the lines of Emerson's clinic in Boston, with some features of other clinics added. We have the additional advantage that the nurses', physicians' and consulting clinics, including the ear, nose, throat, posture and tuberculosis services, are operated from the same building. During summer months, adenoid and tonsil clinics are also conducted. In this way, we are able to do much as Dr. Wile does at the Mount Sinai clinic, viz., ask that handicaps be removed so that, as Dr. Emerson says, the child may be free to gain. Tonsils and adenoids must often be removed before a child may make great headway in nutrition class.

We are fortunate in the nutrition service in having Dr. F. W. Tidmarsh in charge, a man with an excellent overseas record and a period of study in Emerson's clinic. The physician is supported by the public health nurses and visiting housekeepers (nutrition workers), who aim to correct any home environment that may be detrimental to health. When nutrition problems are paramount, the visiting housekeeper does the bulk of the home teaching, the nurse going occasionally. The visiting housekeeper is trained to go into the home and teach the housewife the kind of food the child needs in order that it may gain. Not only does she explain the kind of food that is needed, but she goes with the mother into the shop or market and teaches her how to buy economically the kind of food the family needs, and the kind the particularly undernourished child needs.

The aim in the health center is to develop only one class of the undernourished of school age, recruiting this class chiefly from homes with open tuberculosis. This class is used for feature purposes and educational publicity. We recognize that the largest and the most desirable places for nutrition classes must be, for some years at least, in the public schools. At present there are three such classes in Halifax public schools.

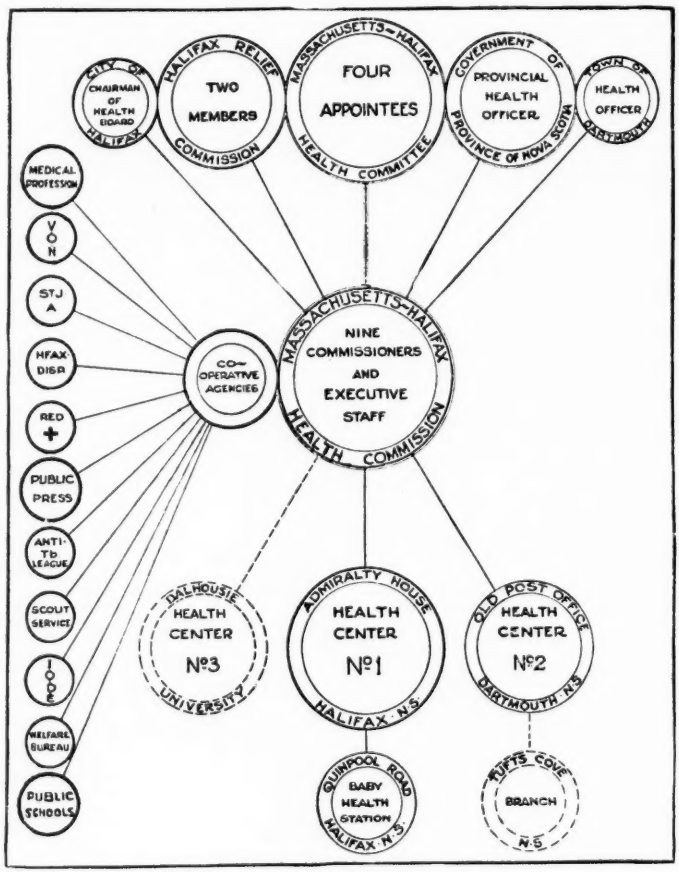
Our larger aim is to give nutrition advice to undernourished children of the preschool age. In that period, children are not so commonly 7, 10 or 15 per cent underweight, but there is quite as much need of nutrition advice alone, or combined with the advice of a pedodontist, as

in the older groups. With these classes we aim to prevent gross malnutrition.

I have more fully described the larger health program in other articles.[2] It will suffice here to have elaborated somewhat on the special services of preschool-age dentistry, a service hardly started in health circles, and on nutrition classes running parallel with them, an innovation in health work until recently largely limited to the school-age period.

One fully organized health center is now operating in the northern part of Halifax with a summer substation for weighing and measuring babies. A second health center, suited to the needs of a population of 8,000, is operating in Dartmouth.

The work of the first health center,



Massachusetts-Halifax Health Commission scheme of co-operation.

[2]Royer, B. F.; *Amer. Jour. Pub. Health* 12:195-201 (March) 1922; M. J. Australia 1:451-456 (April 29) 1922.

when reviewed by representatives of the International Health Board of the Rockefeller Foundation, influenced them to "earmark" $200,000 for building a Dalhousie health center for the south end of Halifax. This new health center is being planned for the university as an integral teaching unit of the medical school, and will serve as an outpatient department to the group of hospitals now growing up in the immediate vicinity of the medical school. With health center service for the southern half of Halifax conducted by the medical faculty from a university building, with public health nurses on the staff, students of medicine will be given great clinical opportunities and will here for the first time be given ample opportunity to study domiciliary causes of diseases, and a chance to acquire a better fundamental groundwork for preventive medicine.

The general scheme of organization and the general plan of operation can perhaps be set forth best diagrammatically. It would be described about as follows: The commission consists of nine men, three of them being members by virtue of their offices: the provincial health officer, the chairman of the Halifax City Health Board and the health officer of the town of Dartmouth. Two are appointed by the Halifax Relief Commission and four by the Massachusetts-Halifax Relief Committee of Boston. The commission acts under a special provincial law, and meets semi-monthly. Policies are determined by the commission, and work is directed through the executive officer and staff. The provincial and local health authorities are members of the commission for the purpose of co-ordinating the established work of each with the new work undertaken by the commission. It is the aim and object of the commission to do such lines of health work as should properly come under the local health officials in each community, and to work in the closest co-operation with all privately endowed philanthropic and charitable agencies, so that a minimum amount of overlapping will occur and waste will be avoided.

The public health nursing program is wholly constructive in character, and is a very large feature of the work. Each nurse is responsible for the entire public health program in the district assigned to her and for the health of every member of each family with whom she comes in contact. She seeks to remove as far as possible domiciliary causes of diseases, and to train and re-educate the family in right methods of living. Bedside nursing is done in emergency only, or for family demonstrations. The Victorian Order of Nurses does the routine bedside work in homes of both communities, and gives general family instruction during such intervals.

Discussion

Isaac D. Rawlings, Springfield, Illinois: The establishment of the Massachusetts-Halifax Health Commission is somewhat unique in that it did not just happen but was the result of the mature deliberation of experts, and with all the facts furnished by a thorough survey of the needs and problems requiring solution to guide them. This commission is somewhat different from most health centers in that a definite plan is mapped out for a five-year period with experts in charge, no politics, adequate finances, a constructive program in all its features, with no duplication of efforts or conflict of authority, and with the entire personnel having but one goal, the lessening of the sick rate and the saving of lives. While the scope and standard of the Massachusetts-Halifax commission are, perhaps, the best yet established, there are many so-called "health centers" which are attempting some or all of the activities carried on by the Massachusetts-Halifax commission. In England such institutions have been quite common. The agency through which the health center operates may be public officials, it may be volunteer organizations, or it may be a combination of the two. The scope of the services performed varies with each health center. At the end of 1917, there were only about a dozen health centers in the United States. Three years later this number had increased to 385, and at present there are still more. Binghamton, N. Y., has established a health center which is producing excellent results. Altogether, eleven activities are brought into close contact, with the result that much lost motion and a great deal of overlapping of activities have been eliminated. In New Haven, Connecticut, a health center has been

in operation for some time which deserves special mention. The center depends largely on private donations to carry on its work. The New York County chapter of the American Red Cross has affiliated all existing health agencies and opened health centers in various parts of New York City. A rather unique experiment in health center work has been established in New York City by the International Lady Garment Workers' Union. This consists of a joint board of sanitary control, a medical division, a dental division and an educational division. Every worker joining the union is required to undergo a complete physical examination. When treatment is required, this is advised and administered. In 1909 the legislature of Illinois passed an "enabling act" permitting the people of any county by referendum to impose on themselves a tax for the care of the dependent tuberculosis patients in the community. At present, more than forty counties of the 102 in the state have taken advantage of this act. The extension of this principle to include the prevention and treatment of all diseases, disabilities and injuries of a community has not been advanced in Illinois. In several other states, notably Iowa, each county has the right to establish a hospital for the care of residents of the county. The highest type of county organization has been reached in New York State, where the board of supervisors of the county was allowed to establish community or health centers. The board of supervisors provides the funds for these centers, and appoints a board of managers who supervise and control the health center. A hospital in such a health center may be constructed, the state paying half of its cost, with provision that the hospital shall not be greater than one bed to each 500 of population. In Illinois a unique health center has been in existence for some time in La Salle, Peru and Oglesby. In 1914, at the township high school of these three cities, a social center was established for welfare and community work. Included was a hygienic institute to cooperate with the departments of health in the three cities. At the head of the hygienic institute was a health officer, under whom served, in each of the cities, an assistant health officer appointed by the mayor of the respective city. This gave the organization a legal standing. The scope of work consisted of enforcement of all local and state laws pertaining to the health of the people.

Anna Rude, Washington, D. C.: The two outstanding points for emphasis in this are, first, the small number of children considered as "malnourished" in the preschool period according to our present standards. These findings corroborate a report on the physical status of the preschool child which the Children's Bureau will soon publish, in which we have not drawn conclusions but have indicated that neither a 7 nor a 10 per cent weight deviation from the weight-height ratio is a standard applicable to the preschool age child. The second point is the importance of prophylactic dentistry during the preschool age. As one observes dental corrections in the schools throughout the country, one must be impressed with the futility of beginning dental repair work during the school age. Of fundamental importance is research in nutritional problems beginning with the mother during pregnancy and followed throughout infancy, and with prophylactic work in the preschool age, if we are going to make any improvement in dental defects in the children of this country.

Reminiscences of Forty-five Years in Dentistry

By C. N. JOHNSON, M.A., L.D.S., D.D.S., M.D.S., F.A.C.D., Chicago, Illinois

XII

IT MAY readily be imagined that in a very active professional career of nearly half a century, I have met many people, and manifestly it has not been possible to remember all of them. My inability to do this has led to some amusing experiences, but never to one more embarrassing than the following. In Chicago at a meeting I was hurriedly introduced to four men from as many different sections of the country, and of course promptly forgot the names as soon as I heard them—which is one of the cardinal sins. In a few days one of them called on me at the college where I was spending the afternoon examining the practical work of the students, and I at once recognized him as one of the gentlemen I had met. But his name was as much of a blank to me as if he had lived on another planet and I had never seen him before. The infirmary superintendent came in the examination room, and I turned to the visitor to extend an introduction. "Doctor," said I, with the stock prevarication, "your name was just on the end of my tongue, but for the moment it has escaped me." The vistor's face broke into a smile and he said: "Doctor, my name is *Johnson.*" I trust that this gentleman had a forgiving nature, and that he was familiar with the ways of men, because the idea that I had my own name on the end of my tongue and could not recall it was too absurd for comment. Since that time I have never prevaricated under similar circumstances—it is too dangerous—there are too many Johnsons!

In all the minor embarrassments of life I know of none quite equal to the hideous predicament of meeting someone you should know, or who thinks you should know him, and not be able to recall the name. One is unmercifully lashed between the fear of giving offense, and the fear of disclosing one's ignorance, and those who have not had the experience of meeting a great number of people under a varied set of circumstances can have no conception of the difficulties encountered in this connection. I have had men look at me in astonishment when I failed to remember their names, after having met them months or even years previously in the most casual way, and been introduced to a dozen at the same time. I believe I have more than the average facility for remembering names, but the perversity of this facility manifests itself in the fact that I am frequently able to remember names under circumstances which make it seem remarkable, while at other times I am wholly unable to recall the names of those with whom I am really well acquainted, and whose names should be almost a household word with me. The human mental mechanism is a peculiar entity, and at times very difficult to understand.

My Correspondence

It has fallen to my lot to enjoy a rather extensive correspondence with members of the profession in different parts of the

world, and it has brought me untold pleasure. To feel that you are reaching out and touching hands with splendid people everywhere gives a zest to life, and keeps the fires of friendship burning brightly. Then my correspondence has led to some unique experiences, a typical one of which was the following: I received a letter from a dentist I had never seen telling me that a new building was being erected in his city, and that he was to have an office in it. He was very anxious to have the best office possible, and asked if I would not draw him some plans and send to him. A week or two later I was with Dr. Black, and taking the letter from my pocket I handed it to him, and asked him what he would do with such a request. He read the letter and said: "I would write and tell him that I was not an architect. What did you do?" "I drew him some plans and sent them to him," I remarked. "Well, you are a bigger ---- than I thought you were," was his curt comment. I am not going to say just what Dr. Black called me, but it was far from complimentary to my intelligence. And yet some time later I was well repaid by receiving a very enthusiastic letter from my unknown friend, saying he had submitted my plans to the architect of the building, and that he had adopted them to the letter, and as a consequence he had the best dental office in the city.

But for the most part correspondents are very considerate of one's time, and if they occasionally work a real hardship on the recipient of their letters, they do it unconsciously, and without the knowledge that he has so many others who are writing him at the same time. Numerous letters come to me as the result of a dilemma on the part of the writer regarding some case in practice. I have thus had brought to my notice some of the most unusual and puzzling conditions that could ever be conceived of, and one in particular was that of a young man the models of whose jaws were sent me for suggestions. It was the most awful wreck of a mouth I have ever seen. The incisors did not meet within three-quarters of an inch, and in fact there were no teeth in contact or occlusion except the third molars on one side, and even these did not occlude properly, the upper one sliding to the lingual of the lower one. There was a pronounced constriction of the upper arch in the bicuspid region, and the teeth were all riddled with caries. I have never witnessed such a total perversion of form and function, and after studying the case from every conceivable point of view, I seized a pen and wrote the dentist. "Kill the patient—I see nothing else that can be done." I received a letter in a few days from the dentist saying: "The patient has been in, but I haven't told him yet what had to be done with him."

Altogether my correspondence has brought me much happiness, and while there are times when it seems as if there are not hours enough in the day—or rather in the night, because all my writing is done at night—to answer my letters, yet I would not willingly dispense with the keen pleasure of thus coming in contact with so many of my distant friends. I hope they will continue to write me, and that I shall continue to find the time to answer them.

Public Speaking

My experiences as a public speaker have been many and varied. I could fill a volume with them, but a few must suffice. One of the most difficult situations I ever encountered as a speaker was in one of our western states where I was to address a woman's club. The experienced speaker will never give a cut-and-dried talk, no matter how perfectly he may have it prepared. He will first "feel out" his audience, and talk accordingly, because no two audiences are precisely alike in their receptive attitude. This was an entirely strange audience to me—never having met any of the ladies before. I had not talked two minutes till

I saw I had my audience with me—all except one. There was a woman there who had the most inscrutable countenance I have ever looked upon. She sat bolt upright with a face immovable as a graven image—a face long, solemn and impenetrable. There was no more shade of change in her expression than if she were a mummy of the Pharaohs—in fact I began to have the uncanny feeling that she must be a mummy, so far as mentality was concerned. That woman fascinated me, and I commenced to talk for her benefit, and at times directly at her. I was determined to break that expression of hers if it were humanly possible. I tried pathos till I had some of the dear ladies nearly weeping, I tried eloquence till the rafters rang, I tried invective against some of the powers that be, and nearly proved that our whole social fabric was drifting hopelessly into the nethermost depths of "innocuous desuetude," but all to no avail. I began to have the uncomfortable feeling that I had met my waterloo, when suddenly I switched and told one of the most ludicrous stories I could garner from a rather plentiful supply. As I reached the climax her countenance "broke ground" and she burst into a smile, and her head dropped forward to hide her merriment. As soon as I decently could, I closed my lecture, and left the platform as nearly exhausted as I ever was after a public talk. That woman came near being my undoing.

As we were leaving the hall, I asked the gentleman, at whose initiative I had given the talk, who that woman was. He broke into a laugh, and said: "Doctor, that is the first time I have ever seen her change countenance in a public talk. She always sits as immovable as you saw her today, but she is really a fine woman, and does much good in the community." *I was glad to hear it.* It atoned for the fact that she had nearly floored me.

Another time I was to give a talk in a certain town—also in the west—on the familiar subject of "Cavity Preparation." As I arrived at the meeting place one of the program committee informed me that they were going to take a stenographic report of my lecture. I expressed a wish that they would not do this for two reasons—one, that I felt I could convey my message better if I did not have to think of a reporter, and the other that I really would not have the time to correct the report. "Never you mind that," said the committeeman, "we are going to take that report."

"Very well," I remarked, "if that is your stand, I shall see that you do not get the report."

"How can you prevent it?"

"I will talk your stenographer down," I said. The committeeman merely smiled a knowing smile, and remarked, "We'll fix that."

As I stepped into the meeting place I found *two* stenographers, a woman and a man. On being introduced to the audience I said: "Ladies and Gentlemen, if there is any one in the rear end of the hall who fails to understand perfectly every word I say, please raise the hand and I will speak more slowly." A smile spread over the faces of the audience, as every one realized that the contest was on.

Speaking on a subject with which I was perfectly familiar I had one of the stenographers backed off the map inside of two minutes, and in less than a minute more, the other one threw down the pencil and leaned back, completely out of the race. I pretended not to notice what had happened as the audience laughed, but went on with my talk without the slightest change of countenance. Needless to say, I was permitted to finish the lecture in peace. Mr. William Whitford, of Chicago, one of the greatest medical stenographers in the world, informs me that my rate when going under full steam would average one hundred and fifty words a minute, which of course is out of all bounds for any stenographer to follow. I am always sorry for the stenographer who undertakes to report me, and so I aim to speak as slowly and

clearly as possible when being reported; but I too frequently become absorbed in my theme and hit up a pace that is the despair of the average reporter. I would therefore prefer always to talk without a reporter, and I feel that I can convey my message to the audience to much better advantage.

Of all the audiences—and I have faced every conceivable kind—I like best of all a class of students in a dental college. That is essentially the real thing. There is a genuineness, an alertness, a responsiveness to a class of boys that brings out the very best there is in a speaker, and I count it as among the happiest experiences of my professional life that for so many years I have been permitted to teach students. I could fill a volume with incidents, amusing and otherwise, connected with college work, but space will permit of only two.

I often think that we do not take seriously enough to heart the mental attitude of a conscientious student toward the problems that confront him in college. Some of these boys have many difficult hills to climb, and I have a feeling that we should aim to go more fully into their individual problems, and study their temperaments more closely, to the end that we may develop them to better advantage. It is so easy to hurt the feelings of a sensitive student without realizing it, as I learned a few years ago.

In examining the prophylactic work done by the students if any deposit is found under the gum the student is sent back with his patient to complete its removal. It becomes a matter of pride with the boys not to be sent back, and a matter of chagrin if they are. It seems that I had sent one boy away the second time with one patient, and he had taken it to heart more than I imagined. At the lecture that night this note came down: "Doctor, how much do you discredit a boy who fails to find the least bit of deposit under the gum where nothing but an experienced hand can find it?" Instantly I grasped the mental distress of that boy for having failed twice, and I said: "My dear Boy, I do not *discredit* him at all. It isn't a matter of discrediting a student for making a mistake, but if I failed to point out your mistake so that you would eventually get over making the same mistake, I would not be doing my duty by you. We expect you to make mistakes, but we do not want you to go on making them always. That is why we try to correct them, no matter how often they are made."

And that was not all I said to the class that night. It gave me an opening for a heart-to-heart talk with the boys, which I am sure resulted in more good than if I had given them my regular technical lecture. The spirit of the class is the essential thing in teaching, and this same spirit results in some wonderful developments in the course of a long career in college work.

One of the best demonstrations of this occurred to me only two or three years ago. As I stepped into the lecture room one evening, I saw that the class was full of mischief—one can feel that in the very air without a word being spoken. Evidently something had happened during the previous lecture hour that had thrown the class off their customary good behavior, and they were apparently ready for student devilment of any kind. To be perfectly frank I rather like this outburst in a class occasionally if it does not get out of bounds. On this occasion I felt that I should be obliged to plunge at once into a rather serious consideration of my subject in order to quiet the boys down, and had just begun to do this when the lights suddenly went out. I said: "Boys, we will have a fuse inserted in a few minutes, and meanwhile we will continue the lecture." Instead of taking advantage of the darkness, and cutting up mischief, the boys instantly quieted down and listened attentively. The janitor reported to me in a moment that something had gone wrong in the engine room, and that we would get no lights. I said: "Never mind, the lec-

ture does not require any illustrations, so we will continue." And for that entire hour those boys sat in perfect darkness, and listened most respectfully to the end of the lecture. I have seldom been more profoundly affected by any of my college experiences than I was by this, and I took occasion to say to the class that any body of boys who had so perfectly developed the instincts of gentlemen as they had, would surely make good professional men.

If any one thing has tended to make of me a better man and dentist, with higher and higher professional ideals, it is my association with students in college, and as I have already intimated, I hold it as one of my most cherished professional privileges that I have been permitted to work among them so long. When I think that more than 4000 of them have gone out into the professional world as "My Boys," I am deeply grateful for the good fortune which has been mine in this particular field of effort.

In approaching the conclusion of these reminiscences, I do so with sincere regret. I have found them so very pleasant, and there is such a mass of material that has come to mind which I have not been able to touch upon, that nothing but the pressure on the pages of the *Journal* could induce me to terminate them at this time. But in all conscience I have taken enough of the space during the past year, and I have the feeling that the editor has been very generous. I must now give way to more important matter, but I make no promise that some time in the future I shall not again "reminisce," and pass in retrospect certain other sidelights on my professional career.

And now in looking back over a varied and active professional experience, I cheerfully record the fact that it has been well worth while, and that I would not willingly exchange a professional life for any other. The professional man comes into a more intimate and vital relationship with his fellowmen than he of any other calling, and I am also inclined to make the claim that he does a more concrete and definite good. He who prolongs human life and makes it more comfortable and efficient is doing a greater service in the world than he who adds merely to its material wealth, and in the sum total of the achievements of men there is surely as great a glory in conquering the foe of disease with the weapons of science, as there is in facing an enemy with muskets on the field of battle.

That the dentist prolongs human life there can be no doubt, and that he does a definite good each day as he contributes his services to the people, it is equally certain. I have lived long enough to see much concrete evidence of this fact, not only to the practice of other men but also in my own. As an illustration, in 1885, when I had not been long out of college, I inserted fourteen gold foil fillings in the molars of one patient and it so happens that on the very day in which I am writing these lines, just thirty-seven years later, I had the pleasure of seeing every one of those fillings doing good service, and apparently in as excellent condition as the day they were inserted. Does any other work in the ordinary walks of life give this tenure of service? I confess to an immense degree of satisfaction as I looked over those fillings, and one of the chief rewards of professional life relates to the accumulating evidence which grows year after year, as one continues in active practice, that his services are proving such a definite source of benefit to his patients.

In all the varied experiences of human life that man is happiest who has served best, and he has served best who has day by day added his mite to the material, the physical, and the moral welfare of his fellowman. In this category must be placed the dentist, and I am therefore glad that I am a dentist.

(*The End.*)

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Editorial Department

Merry Christmas and Happy New Year to Our Subscribers

ONE HUNDRED PER CENT FOR THE CHRISTMAS SEALS FROM EVERY STATE THIS YEAR

As the approaching sentiment of Christmas begins to permeate the air, our thoughts quite naturally turn to the nobler impulses of life, and we are moved by the more generous and sublime attributes of our nature to do things which in the prosaic atmosphere of our every day lives do

not so much appeal to us. Christmas is the season of charity and of loving kindness—charity for the faults and frailties of others, loving kindness for the sons and daughters of mankind—the unfortunate as well as the fortunate. If we could extend the beautiful sentiment of Christmas on through the coming year we would grow in grace, and broaden out into better men and better women.

And we of the dental profession have an unusual opportunity to make the Christmas spirit felt, not only through the approaching year but through the limitless years to come. The RELIEF FUND of the American Dental Association furnishes a fitting medium whereby the members may show forth the faith that is in them, and demonstrate a real Christmas sentiment in a tangible and altogether praiseworthy way. The Christmas seals are to be mailed again this year, and we make a most earnest appeal to every member to remit. The goal set for this fund before any of the income can be used for relief is $100,000, and this may be realized this year if all of our members take advantage of the privilege accorded them to accept and remit for the seals. The amount is very small for each one, but the aggregate runs into quite a respectable figure.

It is the hope that the committee may soon be able to discontinue sending the seals. In fact there has been an intimation on the part of the Tuberculosis Association to the effect that they would appreciate being left alone in the field of Christmas seals, and this so much appealed to the Relief Fund Committee that they brought in a resolution at the Los Angeles meeting as follows:

> "That the American Dental Association send a letter, which has been approved by the Board of Trustees, to the Tuberculosis Association to the effect that the American Dental Association approve of their proposition of having exclusive sale of Christmas seals, and that the Association would co-operate with them as soon as other organizations discontinued the seals.
>
> "That the American Dental Association continue to sell seals for next year to raise the fund to $100,000 through state societies and members of the committee in every state.
>
> "That the committee, through the Secretary of the American Dental Association, ask for voluntary contributions of all state societies from their members annually to raise this fund to $100,000."

This motion was carried, and it is now up to the membership to consummate the work so admirably begun by the Committee and place this fund on a permanent basis. It is with this idea that the seals are to be sent out this year in the hope that this may be the last time it is found necessary. They would probably have been discontinued at this

time had the committee not learned that there were quite a number of other organizations who were sending out seals, and it was felt that our Association should be accorded the same privilege till such time as the others respected the wishes of the Tuberculosis Association and discontinued.

Here then is our golden opportunity to carry this most laudable project to a successful issue. The Relief Fund Committee has worked hard, and has succeeded in bringing the fund so near the ultimate mark that it remains only for the membership everywhere to enclose their contributions of one dollar each, the moment the seals are delivered this Christmas, and see this enterprise in which we are all so vitally interested finally consummated.

Now, all together—shoulder to shoulder—and let's "GO OVER THE TOP."

PLANS FOR RELIEF FUND CHRISTMAS SEALS

The House of Delegates at the Los Angeles meeting adopted plans for the distribution of 1922 Christmas seals. This body adopted resolutions urging every state society to visualize 100 per cent contribution from its membership for this worthy cause.

The State Society officers and Relief Fund Committee in each state should inaugurate plans for the hardest drive in the state that has ever been made for the purpose of giving financial relief to needy dentists. The program outlined is to have every member of the American Dental Association contribute at least $1.00, thus making it possible for us to immediately begin to perfect our plans for the distribution of these funds.

The record of every state society is published in the Secretary's Report under Schedule "L" in the September issue of the *Journal.* This report records the fact that a few state societies made a commendable record last year.

A package of seals have already been presented to every member of the American Dental Association.

The Relief Fund should be increased $25,000 this year. It is so easy for each dentist to contribute his dollar or more to the cause, but it is just as easy to overlook it in the rush of other matters. This is to remind the members not to forget it.

MEMBERSHIP DUES DUE JANUARY 1, 1923

All dues, which include the annual subscription to *The Journal of the American Dental Association*, are due January 1 of each year. The March *Journal* will not be mailed to any delinquent members. The ruling of the post office authorities is adamant on this proposition. Therefore, any dentist who has not already paid his state society dues for 1923 should do so immediately. The state society officers are co-operating with the American Dental Association and will immediately, on receipt of the state dues, mail the national dues to the national office.

It will be impossible for us to furnish back copies, as we are printing only enough to supply our bona fide mailing list. An immediate compliance with this notice will save the delinquent member a great deal of confusion and misunderstanding. A delinquent member is one who does not have his 1923 membership card on January 2, 1923.

PROTECTING SCIENTIFIC RESEARCH AT THE POLLS

At the polls in November, in California, Colorado and Washington, scientific medicine will be tried at the bar of public opinion. The verdict will depend in part on public knowledge of the attainments and conduct of physicians in the past. The true physician, as attorney for the defense, will be actively campaigning against the antis of all kinds, and he will be especially active on election day, when the case goes to the jury.

In Colorado and in California, the people will decide by popular vote whether medical research involving the use of living animals shall be prevented. The anti-vivisectionists in these states, mistrusting or despising their legislatures, are seeking, through the initiative, to bring about the enactment of such measures by playing on the ignorance and the emotions of the people. No properly informed person can vote in favor of the anti-vivisectionist measures proposed.

In Washington, the contest is being fought under the referendum to restrict the activities of the health authorities with respect to the sanitary and hygienic control of the public schools. The foes of scientific medicine, among them those who even deny the existence of disease, procured the passage of an act in 1921 granting to parents the privilege of forbidding examination of their children in school by the health authorities. The public health forces of the state, recognizing the danger to public health inherent in this measure, have procured its submission

to the people, and it will be voted on, November 7. The demand for this uncivilized legislation was presumably due to recognition, by the enemies of medical science, that medical mysticism and quackery cannot thrive in a community enlightened with respect to modern medicine, and that the public schools constitute the great channel through which the people can be enlightened and future generations gain from the past. In fact, opposition to the rejection of this measure is an attempt to destroy one of the most effective methods of teaching facts concerning disease, namely, by their active application in school administration.

In California, members of two of the cults that now infest the medical underworld are fighting through the initiative to free themselves from control. The liberal and fair-minded provisions for licensing their practitioners do not satisfy them. Chiropractors have been defying the law, and, when convicted and sentenced, have gone to jail rather than pay fines, thus posing as martyrs. Apparently neither cult will be satisfied by any measure that does not allow it to pursue its own course at its own sweet will.

The medical profession must see that no ground is lost to the enemies of scientific medicine and particularly of preventive medicine. The debt of the physician to his patient and his community cannot be discharged by proxy. Personal service, intelligently, energetically and loyally rendered, is absolutely essential to success, if the results of the contest are to be certain and complete. Every physician in each of the communities now laboring under the threat of this dangerous legislation should devote an hour or two each day between now and election to enlightening his patients and friends, to informing them as to what is right and to urging them to act on behalf of the right. Thus he will not only be doing his proper part as a true physician but also as a good citizen.—*Jour. Amer. Med. Assoc.*, Vol. 79, No. 18, p. 1520.

DENTAL ADVERTISING

Of recent years some dentists in Toronto, Canada, have been advertising in the daily papers in a manner unbecoming to the dignity of a profession like dentistry. As time has passed more and more of this "improper conduct in a professional sense" has been practiced. The form of advertising has changed from that of bragging about the advertiser's skill to those methods followed by large stores who sell thirty-five pairs of boots between eight and nine o'clock in the morning at a ridiculously low price. This is done to get a number of people in the early morning who may buy other things and to get business started for

the day. People who consult such dental advertisers at 8:45 get a premium. Another scheme is to advertise that a hundred sets of some special sets of teeth have been purchased at a low price and while they last artificial teeth will be sold for twelve dollars a set.

All this kind of advertising has for its purpose the attracting of those who need dentistry done. This is made the more attractive when it is stated that some dentists charge fifty dollars for a similar set. Any advertising which depends upon the smallness of the price of the article sold for its success must be looked upon with suspicion especially if the purchaser does not know the value of the article advertised. On the whole, everybody must expect to pay what a thing is worth and if a dentist makes artificial teeth he expects to be paid for them or he would not make them. Artificial teeth cannot be made any more cheaply between eight and nine in the morning than at any other time of the day. It costs the same on Tuesdays or on Saturdays. Having bought a number of sets of teeth at a low cost has little to do with the cost of a denture. What difference does it really make on a $10 or $20 or a hundred dollar denture whether the procelain teeth in them costs a dollar or seventy-two cents. The chief cost in any dental service is the skill. Such advertisers have no special skill to give away for nothing. Most of them are in a business, not in a profession at all. They receive payment for goods delivered, not fees for services rendered.

The Discipline Committee of the Board asked three offenders to appear before them to show cause why their licenses should not be revoked for such advertising. The defendants were represented by counsel and reporters from the daily press. It was held that the committee failed in its charges because it did not at the outset prove that the accused had inserted the advertisements. Counsel for the committee held that such proof as the signed advertisements was sufficient.

The daily press with its usual business acumen made capital out of the proceedings of the committee. They made it appear that the cause of complaint against the accused was the lowness of their charges, while, as a matter of fact, there was absolutely no mention of fees whatsoever in the first case, and in the second the accused said someone had charged $300 for a denture which was promptly challenged by the committee. The verbatim report contains no reference to a charge against the accused for advertising small fees. This statement in the press was made out of whole cloth by the reporters. Then along comes one of our best weeklies with an article about schedule of fees, closed corporation, etc. We may state for their benefit that there is no schedule of fees in dentistry.

Lawyers, physicians, engineers, plumbers, publishers, and other

trade unionists cannot understand the dental profession who have no fixed fees.

Many of the newspapers of the province have taken the opportunity to attack the dental profession ostensibly because of the fees they charge but in reality because they do not use their columns for fire sales of teeth. One weekly gloated over the fact that it had not published an article of information on the care of teeth sent out by the profession because it was not accompanied with a cheque to cover printing charges. Such an editor cannot see past his own nose. By some kind of back-action reasoning, he imagines that dentists will in some way benefit financially if they give out such information as will make it possible for people to prevent diseases of their own teeth.

The creation of a false impression in the public mind of what occurred at the investigation by the press for its own benefit is in the long run poor business.

If any dentist will write to Dr. Gordon McLean, Bloor St., E., Toronto, he may have a copy of the evidence taken at the committee meeting in which he will get a correct statement of what occurred. The committee is not guessing about what to do. It is following the best legal advice and the procedure followed in similar cases tried abroad. There is no question of fees either large or small up for discussion, it is simply a matter of improper conduct in a professional sense.—*Dominion Dental Journal*, October, 1922.

Announcements

CALENDAR OF MEETINGS

NATIONAL SOCIETIES

American Dental Association, September 10-14, 1923, Cleveland, Ohio.

American Society of Orthodontists, April 9, 10, 11, 1923, Edgewater Beach Hotel, Chicago, Illinois.

STATE SOCIETIES

February (1923)

Minnesota, at St. Paul (6-8).

March

Michigan, at Detroit (27, 28, 29, 30, 31).
Vermont, at Burlington (21, 22, 23).

April

Alabama, at Birmingham (2nd Tuesday).
Connecticut, at Hartford (19, 20, 21).
Kentucky, at Louisville (16, 17, 18, 19).
Kansas, at Wichita.
Mississippi, at Laurel.
Missouri, at St. Louis.
New Jersey, at Trenton (11, 12, 13).

May

Illinois, at Decatur (8, 9, 10).
Indiana, at Indianapolis (14, 15, 16, 17).
Iowa, at Des Moines (1, 2, 3).
Louisiana, at New Orleans.
Massachusetts, at Boston (2, 3, 4).
Nebraska, at Omaha (21, 22, 23, 24).
New York, at New York City (9, 10, 11, 12).
North Carolina and Virginia, at Pinehurst, N. C. (7).
Pennsylvania, at Philadelphia (15, 16, 17).
South Dakota, at Huron.
Tennessee, at Nashville (2, 3, 4, 5).
West Virginia, at Wheeling (21, 22, 23).

June

California, at San Francisco (11-15).
Colorado, Troutdale-in-the-pines, (14, 15, 16).
Idaho, at Boise.
New Hampshire, at The Weirs (21, 22).
Southern California, at Los Angeles.
Utah, at Salt Lake City.
Wyoming, at Loraine.

July

Montana, at Missoula.
Wisconsin, at Milwaukee (10, 11, 12).

MEETINGS OF STATE BOARD OF DENTAL EXAMINERS

Arkansas, December 15. Secretary, H. J. Crume, Wilson Bldg., El Dorado.

Colorado, at State House, Denver, first Tuesdays of December and June, continuing five days. Secretary, Wm. H. Flint, Littleton.

Delaware, at Wilmington, Municipal Bldg., January 17 and 18. Secretary, W. S. P. Combs, Middletown.

District of Columbia, at Washington, D. C., January 15 to 19. W. M. Simkins, Woodward Bldg., Washington, D. C.

North Carolina, at Wilson, January 11. Secretary, F. L. Hunt, Ashville.

Oklahoma, at State Capitol Building, Oklahoma City, December 18.

South Dakota, at Sioux Falls, January 8. Secretary, L. R. Walston, Redfield.

Texas, at Dental College, Houston, December 11 to 14 inclusive. Secretary, R. L. Rogers, Amarillo.

Wisconsin, at Milwaukee, December 18 to 22. Secretary, J. L. Blish, Fond du Lac.

MINNESOTA STATE DENTAL ASSOCIATION

The fortieth annual meeting of the Minnesota State Dental Association will be held at the St. Paul Auditorium, St. Paul, Minn., February 6, 7, 8 and 9, 1923. The St. Paul Hotel will be the official headquarters for the meeting.

C. H. TURNQUIST, *Secretary*
388 LaSalle Bldg., Minneapolis, Minn.

FIFTY-NINTH ANNUAL MEETING OF CHICAGO DENTAL SOCIETY

JANUARY 18, 19 AND 20, 1923

THE DRAKE HOTEL

The Chicago Dental Society send greetings to members of the American Dental Association and all other ethical members of the profession and invites them most cordially to attend the fifty-ninth annual meeting of the society, January 18, 19 and 20, 1923.

The program has been prepared with special reference to the timely subject of preventive dentistry, but ample space has been given both to the fundamentals and to the modern development of the profession. It has been the purpose of the program committee to present every phase of dentistry, under the direction of recognized authorities, so that each visitor to the meeting may find a solution of his own particular problem as well as inspiration along new lines. Essayists of national reputation will bring messages of interest and profit to each of us. There will be the usual wealth of dental exhibits to attract and to furnish suggestions for the equipment of an up-to-date dental office.

A cordial invitation is also extended to the wives of visiting dentists and entertainment will be provided for them.

A tentative outline of the program follows:

FIFTY-NINTH ANNUAL MEETING AND CLINIC CHICAGO DENTAL SOCIETY

THE DRAKE HOTEL

JANUARY 18, 19 AND 20, 1923

FULL-DAY SECTIONS

THURSDAY

Lecture Clinics by Chicago Men

MORNING AND AFTERNOON

Section No. 1.—Full Denture Construction.

Chicago Prosthetic Clinic Club,
Clarence A. Dodge, *President.*

Section No. 2.—Full Denture Technic.

John B. LaDue and Group.

Section No. 3.—Histology and Pathology of Dental Tissues.
(Staining, freezing, and projecting microscopic specimens and slides).

Edward H. Hatton
William G. Skillen
Newton G. Thomas

HALF-DAY SECTIONS

Morning and Afternoon

Section No. 4.—General Diagnosis.
(Morning) Thomas L. Gilmer.
(Afternoon) William H. G. Logan.
(Drs. Gilmer and Logan will bring patients and discuss their cases).

Section No. 5.—Porcelain Jacket Crown Technic.
(Morning) Stanley J. Tylman and Associates.
(Afternoon) George A. Thompson and Associates.

Section No. 6.—Partial Denture Technic. F. E. Roach.

Section No. 7.—Gold Inlay Technic.
(Morning) P. A. Pyper.
(Afternoon) R. E. Blackwell and Theo. B. Kurtz.

Section No. 8.—Periodontal Membrane Problems.
(Morning) Edgar D. Coolidge.
(Afternoon) F. W. Merrifield and G. R. Lundquist.

Section No. 9.—Crown and Fixed Bridge-Work.
(Morning) Robert E. MacBoyle.
(Afternoon) Hart J. Goslee.

Section No. 10.—Block Anesthesia.
(Morning) Earle H. Thomas.
(Afternoon) Charles W. Freeman.

Section No. 11.—Radiographic Interpretation.
(Morning) J. H. Prothero.
(Afternoon) Hollis E. Potter, M.D.

Section No. 12.—Movable Removable Bridge-Work. George A. Thompson.

Section No. 13.—Oral Surgery and Anesthetics.
10:00 A. M.—Herbert A. Potts and Assistants—At Northwestern University Dental School, 31 West Lake Street.
10:00 A. M.—William H. G. Logan and Assistants—At Chicago College of Dental Surgery, 1747 West Harrison Street.
10:00 A. M.—Frederick B. Moorehead and Louis Schultz—University of Illinois College of Dentistry, 1838 West Harrison Street.

Section No. 14.—Extraction and Anesthetics.
2:00 P. M.—Stanley W. Clark—At Northwestern University Dental School 31 West Lake Street.
2:00 P. M.—B. A. Morris and George F. Vogt—Chicago College of Dental Surgery, 1747 West Harrison Street.
2:00 P. M.—C. W. Stewart and L. F. Hein—University of Illinois College of Dentistry, 1838 West Harrison Street.

EVENING

6:30 P. M.—Banquet in honor of Past-Presidents of Chicago Dental Society—Ball Room, The Drake.

FRIDAY

GENERAL SESSION—THE BALL ROOM

9:00 A. M.—Syphilis of the Mouth.

Herman N. Bundeson, M. D.,
Commissioner of Health, City of Chicago.

10:30 A. M.—Health Protection in Dental Practice.

Arthur D. Black.

2:00 to 4:30 P. M.—Lecture Clinics by Out-of-town Men.

Section No. 1.—Root-Canal Problems.

To be announced later.

Section No. 2.—Full Denture Technic.

Walter F. Chappelle, Buffalo, N. Y.

Section No. 3.—Prophylaxis.

Frederick A. Bricker, Rochester, Minn.

Section No. 4.—Gold Inlay Technic.

L. C. Burgard, Louisville, Ky.

Section No. 5.—Dentistry during Childhood.

Thomas McCrum, Kansas City, Mo.

STUDY CLUB

(Tickets issued to out-of-town men only).

Section No. 1.—Full Denture Work.

W. S. Heermans.

Section No. 2.—Conductive Anesthesia.

P. G. Puterbaugh

(The Study Club Committee of the Chicago Dental Society extends to out-of-town dentists the privilege which members of the Chicago Dental Society have enjoyed for two years, presenting two sections selected from this year's series, with the same instructors).

EXHIBITS

Friday, from 9:00 A. M. to 5:00 P. M. exhibits pertaining to preventive dentistry will be presented, including display from the Museum of Northwestern University Dental School, under the direction of Dr. William Bebb, an exhibit on the feeding of children, material on infant welfare work, and a series of toothbrush drills.

EVENING

8:00 P. M.—The Prevention of Dental Irregularities.

Frederick B. Noyes.

9:00 P. M.—Carcinoma of the Mouth.

Vilray P. Blair, M.D., St. Louis, Mo.

Discussion.

Thomas L. Gilmer
William H. G. Logan

SATURDAY

General Clinics

9:30 A. M. to 12:30 P. M.—The Clinic Committee presents a wide range of subjects. Approximately one hundred clinicians from the Chicago Dental Society and from other societies will present chair and table clinics of interest.

Manufacturers' Exhibits

11:30 A. M. to 2:30 P. M. and 4:30 P. M. to 5:30 P. M. Thursday and Friday.

THE DRAKE

The Chicago Dental Society returns to The Drake this year for its annual meeting. Our experience of last year justifies us, we believe, in assuring all visiting dentists that their stay will be a thoroughly enjoyable one. Reservations should be made early as a large registration is anticipated. Rates for single rooms, with bath are $4.00, $5.00, $6.00, $7.00 and $8.00 per day. Small double rooms, containing one double bed, with bath are $6.00 and $7.00 per day; large double rooms, containing two beds, with bath, are $8.00, $10.00, $12.00 and $14.00 per day. The rate for double rooms is the same when occupied by one or two persons. The Italian Restaurant serves a table d'hote luncheon at 75 cents and dinner at $1.50. Meals in the main dining-room are served a la carte.

PRACTICAL DENTISTRY

The Colorado State Association meeting will be held June 14, 15 and 16, 1923, at Troutdale-in-the-Pines, up Bear Creek Canon, thirty miles from Denver.

This beautiful place will be turned over to the association for its exclusive use during the meeting. Just visualize what that means. There will be excellent accommodations for all dentists, exhibitors, their families and friends.

For a flat rate of $6.00 a day, American plan, we get eats, sleep, music, dancing, tennis, golf, boating, fishing, swimming, playgounds for the kiddies, and everything.

The slogan for the meeting will be "Practical Dentistry." Not that any good dentistry isn't practical, but our idea is to have such things as we can take home and utilize every day during the year—something that will enable us to do more work, better work, and do it more quickly. The program will be built around that idea.

SOUTHWESTERN SOCIETY OF ORTHODONTISTS

The third annual session of the Southwestern Society of Orthodontists will be held at the Gunter Hotel, San Antonio, Texas, January 17, 18, 19 and 20, 1923. A cordial invitation is extended to all ethical practitioners interested in Orthodontia. The San Antonio Dental Society will hold its midwinter meeting in conjunction with the Orthodontists on the day of the 20th.

P. G. SPENCER, *Secretary and Treasurer*
Amicable Bldg., Waco, Texas.

DELAWARE STATE BOARD OF EXAMINERS

The next meeting of the Delaware State Board of Dental Examiners will be held in Wilmington, Delaware, Municipal Building, January 17 and 18.

For further information write

W. S. P. COMBS, *Secretary*
Middletown, Delaware.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS

The next meeting of the Board of Dental Examiners of the District of Columbia will be held in Washington, January 15 to 19, 1923. For further information write

W. M. SIMKINS,
Woodward Building, Washington, D. C.

SOUTH DAKOTA BOARD OF DENTAL EXAMINERS

The next meeting of the South Dakota State Board of Dental Examiners will be held at Sioux Falls, South Dakota, commencing promptly at 1 P. M., January 8, 1923. For further information and application blanks address

L. R. WALSTON, *Secretary*
Redfield, South Dakota

ALPHA OMEGA FRATERNITY

The fifteenth annual convention of the Alpha Omega (Dental) Fraternity will be held in Philadelphia on December 27, 28 and 29, 1922.

NEW BOOKS RECEIVED FOR THE LIBRARY OF THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

The Journal of the American Dental Association promptly acknowledges here the receipt of new publications. Books selected from those named on this list are reviewed below. Reviews are matter-of-fact statements of the nature and contents of the publications referred to and are intended *solely to guide possible purchasers.*

Dental and Oral Radiography. James David McCoy, M.S., D.D.S., F.A.C.D., Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California, Los Angeles Cal. A textbook for students and practitioners of dentistry, printed by C. V. Mosby Co., St. Louis, Mo. Third Edition; 166 illustrations, $3.00.

Anthony's Dental Dictionary. A dictionary of Dental Science by L. Pierce Anthony, D.D.S., Associate Editor of the *Dental Cosmos;* Chairman of the Committee on Nomenclature of the American Dental Association. Lea & Febiger, Philadelphia. Illustrated, $4.50.

Orthodontic Impressions and Casts. Herbert A. Pullen, D.M.D., Professor of Orthodontia, Dental Department, University of Buffalo. 80 illustrations; published by P. Blakiston's Son & Co., Philadelphia.

Aids to Dental Anatomy and Physiology. Arthur S. Underwood, M.R.C.S., L.D.S. Fourth Edition, revised by Bayford Underwood, M.B., B.S., L.R.C.P., M.R.C.S., L.D.S., University of Bristol. Publishers, William Wood & Co., New York. Price $1.75 net.

DIRECTORY OF STATE SOCIETIES FOR 1922-1923

Alabama—Birmingham, April, 2nd Tuesday, 1923.
President: Charles G. Dillard, Huntsville.
Secretary: Geo. W. Bledsoe, Cullman.
Treasurer: C. W. Lokey, Empire Bldg., Birmingham.

Alaska—
President: E. F. Germain, Anchorage.
Secretary: L. S. Keller, Skagway.
Treasurer: L. S. Keller, Skagway.

Arizona—Chandler, Nov. 2, 3, 1923.
President: W. G. Barackman, Chandler.
Secretary: J. C. Roberts, 44 N. 1st Ave., Phoenix.
Treasurer: J. C. Roberts, 44 N. 1st Ave., Phoenix.

Arkansas—Little Rock.
President: T. J. Newman, Boyle Bldg., Little Rock.
Secretary: James T. Peay, Boyle Bldg., Little Rock.
Treasurer: James T. Peay, Boyle Bldg., Little Rock.

Southern California—Los Angeles, June, 1923.
President: Julio Endelman, Pantages Theatre Bldg., Los Angeles.
Secretary: Bert Boyd, 1010 Story Bldg., Los Angeles.
Treasurer: C. C. Noble, Wright-Callender Bldg., Los Angeles.

California State—San Francisco, June 11-15, 1923.
President: John D. Millikin, 323 Geary St. San Francisco.
Secretary: B. Frank Gray, 909 Hyde St., San Francisco.
Treasurer: Robert E. Keys, 391 Sutter St., San Francisco.

Colorado—Troutdale, June 14, 15, 16, 1923.
President: A. Clay Withers, 610 California Bldg., Denver.
Secretary: Harry W. Wilson, 421 Imperial Bldg., Denver.
Treasurer: William Smedley, 610 California Bldg., Denver.

Connecticut—Hartford, April 19, 20, 21, 1923.
President: John F. Barton, 43 Farmington Ave., Hartford.
Secretary: S. E. Armstrong, 792 Chapel St., New Haven.
Treasurer: Arthur B. Holmes, 63 Bank St., Waterbury.

Delaware—Wilmington, October 11, 1923.
President: G. A. Hitch, Laurel.
Secretary: D. C. Peters, Delaware Ave. & Washington St., Wilmington.
Treasurer: P. A. Traynor, 807 Washington St., Wilmington.

District of Columbia—Washington, D. C., October 10, 1922.
President: Thos. J. Rice, 921 15th St., N. W., Washington.
Secretary: W. M. Simkins, 720 Woodward Bldg., Washington, D. C.
Treasurer: M. F. Finley, 1928 I St., N. W., Washington, D. C.

Florida—Jacksonville, Nov. 9, 10, 11, 1922.
President: Gordon B. Tison, Gainsville.
Secretary: H. B. Pattishall, 111 W. Adams St., Jacksonville.
Treasurer: H. B. Pattishall, 111 W. Adams St., Jacksonville.

Georgia—Athens.
President: N. A. Teague, Augusta.
Secretary: G. A. Mitchell, Candler Bldg., Atlanta.
Treasurer: Witherspoon Wallace, Candler Bldg., Atlanta.

Hawaiian Islands—
President: J. M. Whitney, 405 Boston Bldg., Honolulu.
Secretary: F. M. Branch, 305 Boston Bldg., Honolulu.
Treasurer: C. B. High, 53 Young Bldg., Honolulu.

Idaho—Boise, June, 1923.
President: F. W. Critchfield, Boise.
Secretary: P. G. Flack, Empire Bldg., Boise.
Treasurer: M. J. Goode, Filer.

Illinois—Decatur, May 8, 9, 10, 1923.
President: E. F. Hazell, 608 E. Capitol Ave. Springfield.
Secretary: Arthur G. Smith, 511 Central Natl. Bk. Bldg., Peoria.
Treasurer: T. L. Grisamore, 29 E. Madison St., Chicago.

Indiana—Indianapolis, May 14-17, 1923.
President: Earl Brooks, Noblesville.
Secretary: A. J. Kimm, 704-5 Citizens Bk. Bldg., Evansville.
Treasurer: W. C. Hessler, Crawfordsville.

Iowa—Des Moines, May 1, 2, 3, 1923.
President: W. C. Boone, Ottumwa.
Secretary: Earle S. Smith, 613 E. Court St., Iowa City.
Treasurer: Frank Fourt, Fairfield.

Kansas—Wichita, April, 1923.
President: Harry N. McFarland, Kansas City.
Secretary: C. K. Weaver, Clay Center.
Treasurer: W. T. Triplett, Salina.

Kentucky—Louisville, April 16-19, 1923.
President: E. C. Hume, 816 Francis Bldg., Louisville.
Secretary: W. M. Randall, 1035 2nd St., Louisville.
Treasurer: R. L. Spratt, Mt. Sterling.

Louisiana—New Orleans, May, 1923.
President: Walter Leabo, Commercial Bank Bldg., Shreveport.
Secretary: Fred Ratzburg, Levy Bldg., Shreveport.
Treasurer: O. J. Ory, Garyville.

Maine—Augusta, June, 1923.
President: H. L. Smith, Congress St., Portland.
Secretary: W. F. Fogg, Waterville.
Treasurer: I. E. Pendleton, Pine St., Lewiston.

Maryland—Baltimore.
President: Arthur Lankford, 201 W. Madison St., Baltimore.
Secretary: N. H. McDonald, Morris Bldg., Baltimore.
Treasurer: H. A. Wilson, Calvert Bank Bldg., Baltimore.

Massachusetts—Boston, May 2, 3, 4, 1923.
President: William Rice, 416 Huntington Ave., Boston.
Secretary: W. Vernon Ryder, 175 Newbury St., Boston.
Treasurer: Joseph T. Paul, 419 Boylston St., Boston.

Michigan—Detroit.
President: William H. Elliott, 7643 Jefferson East, Detroit.
Secretary: Wm. A. Cook, 1853-55 David Whitney Bldg., Detroit.
Treasurer: E. J. Chamberlin, 519 Ashton Bldg., Grand Rapids.

Minnesota—St. Paul.
President: H. B. Washburn, University & Raymond, St. Paul.
Secretary: C. H. Turnquist, 338 LaSalle Bldg., Minneapolis.
Treasurer: T. D. Abernathy, Dental Bldg., Rochester.

Mississippi—Laurel, April, 1923.
President: G. A. Rush, Meridean.
Secretary: A. A. Allen, Amory.
Treasurer: C. K. Bailey, Grenada.

Missouri—St. Louis, April, 1923.
President: R. H. McCrum, Springfield.
Secretary: H. C. Pollock, 723 Metropolitan Bldg., St. Louis.
Treasurer: J. F. McLellan, Moberly.

Montana—Missoula, July, 1923.
President: G. J. Packard, Livingston.
Secretary: J. E. Baker, Great Falls.
Treasurer: J. E. Baker, Great Falls.

National Capital—George Washington University, October 3, 1922.
President: C. Williard Camalier, Washington, D. C.
Secretary: W. M. Dolmage, 825 Vermont Ave., Washington.
Treasurer: W. L. Gansman, 2000 14th St., N. W., Washington.

Nebraska—Omaha, May 21-24, 1923.
President: M. H. Dunham, First National Bank Bldg., Omaha.
Secretary: H. E. King, Omaha.
Treasurer: G. A. Grubb, Ganter Blk., Lincoln.

New Hampshire—The Weirs, June 21, 22, 1923.
President: A. A. Blondin, Manchester.
Secretary: L. I. Moulton, 15 N. Main St., Concord.
Treasurer: Wm. A. Young, 40 N. Main St., Concord.

New Jersey—
President: E. C. Stillwell, Arcade Bldg., Glen Ridge.
Secretary: F. K. Heazelton, 223 E. Hanover St., Trenton.
Treasurer: A. E. Boice, Broad St., Bank Bldg., Trenton.

New Mexico—Albuquerque.
President: C. W. Hoover, Dawson.
Secretary: D. P. Nolting, Albuquerque.
Treasurer: D. P. Nolting, Albuquerque.

New York—New York City, May 10, 1923.
President: A. W. Twiggar, Ossining.
Secretary: A. P. Burkhart, 89 Genesee St., **Auburn.**
Treasurer: G. H. Butler, 715 University Block, Syracuse.

North Carolina—Pinehurst, May 7, 1923.
President: S. Robt. Horton, Raleigh.
Secretary: H. O. Lineberger, Raleigh.
Treasurer: E. G. Click, Elkin.

North Dakota—Bismarck, June, 1923.
Vice-President: Ira H. Wells, Harvey.
Secretary: C. D. Price, 539 de Lendrecie Bldg., Fargo.
Treasurer: R. S. Towne, Bismarck.

Ohio—Cincinnati, December 5-7, 1922.
President: C. H. Schott, 1004 Neave Bldg., Cincinnati.
Secretary: F. R. Chapman, 305 Schultz Bldg., Columbus.
Treasurer: A. O. Ross, 807 No. High St., Columbus, Ohio.

Oklahoma—
President: L. M. Doss, American Bank Bldg., Oklahoma City.
Secretary: A. B. Walker, Fairview.
Treasurer: J. B. Jenkins, American Bank Bldg., Oklahoma City.

Oregon—Portland, December 7, 8, 9, 1922.
President: Clyde Mount, Oregon City.
Secretary: W. C. Shearer, 412 Stevens Bldg., Portland.
Treasurer: A. P. Watson, Morgan Bldg., Portland.

Pennsylvania—Philadelphia, May 15-17, 1923.
President: E. R. Sausser, 235 S. 15th St., Philadelphia.
Secretary: A. C. Barclay, 914 Highland Bldg., Pittsburgh.
Treasurer: A. B. Miller, 299 Wyoming Ave., Kingston.

Rhode Island—Providence, October, 1922, and January, 1923.
President: Frederick L. Miller, 101 Main St., Woonsocket.
Secretary: Ambrose H. Lynch, 511 Westminister St., Providence.
Treasurer: Chas. J. Smith, 146 Westminster St., Providence.

South Carolina—Myrtle Beach, June, 1923.
President: J. P. Glenn, Spartansburg.
Secretary: Ernest C. Dye, Greenville.
Treasurer: A. H. Corley, Edgefield.

South Dakota—Huron, May, 1923.
President: Oscar W. Hanson, Madison.
Secretary: Chester K. Walker, Huron.
Treasurer: A. O. Wallmann, Huron.

Tennessee—Nashville, May 2, 3, 4, 5, 1923.
President: O. A. Oliver, Lambuth Bldg., Nashville.
Secretary: Joe Minor, Lambuth Bldg., Nashville.
Treasurer: Joe Minor, Lambuth Bldg., Nashville.

Texas—Forth Worth.
President: A. L. Frew, 4105 Live Oak St., Dallas.
Secretary: J. G. Fife, 1813 Main St., Dallas.
Treasurer: J. G. Fife, 1813 Main St., Dallas.

Utah—Salt Lake City, June, 1923.
President: R. L. Watson, Judge Bldg., Salt Lake City.
Secretary: Ernest W. Browning, Boston Bldg., Salt Lake City.
Treasurer: Ernest W. Browning, Boston Bldg., Salt Lake City.

Vermont—Burlington, March 21-23, 1923.
President: O. S. Nims, Burlington.
Secretary: Carter R. Woods, Rutland.
Treasurer: Thomas Mound, Rutland.

Virginia—Richmond, October 18-21, 1922.
President: M. B. Rudd, Chamber of Commerce Bldg., Richmond.
Secretary-Treas.: Harry Bear, 410 Professional Bldg., Richmond.

Washington—
President: S. A. Fulton, Walla Walla.
Secretary: W. B. Power, Cobb Bldg., Seattle.
Treasurer: W. B. Power, Cobb Bldg., Seattle.

West Virginia—Wheeling, May 21-23, 1923.
President: Geo. C. Howard, West Union.
Secretary: N. P. MacDermid, Capital St., Charleston.
Treasurer: J. S. Stone, Clarksburg.

Wisconsin—Milwaukee, July 10-12, 1923.
President: Adolph Gropper, Goldsmith Bldg., Milwaukee.
Secretary: R. W. Huegel, 104 King St., Madison.
Treasurer: P. W. Rood, Milwaukee.

Wyoming—Laramie, June.
President: J. H. Farlin, Worland.
Secretary: Earl C. Andrew, Cheyenne.
Treasurer: Peter Appel, Jr., Cheyenne.

DENTAL CORPS ORDERS FROM WAR DEPARTMENT

Army

Major Earle J. McClung upon completion of present tour of foreign service to duty at Fort Douglas, Utah.

Major Thomas C. Daniels from duty at Presidio of San Francisco to duty at Fort Scott, Calif.

Major Lee S. Fountain from duty at Walter Reed General Hospital, D. C., to duty at Fort McPherson, Ga.

Major Rex McK. McDowell from duty at Walter Reed General Hospital, D. C., to duty at Fort H. G. Wright, N. Y.

Major James G. Morningstar from duty at Fort McPherson, Ga., to duty at Walter Reed General Hospital, D. C.

Major Charles M. Taylor from duty at Washington to duty at Langley Field, Va.

Captain John S. Ross from duty at Walter Reed General Hospital, D. C., to Camp Humphreys, Va., for duty.

Captain William B. Caldwell from duty at Walter Reed General Hospital, D. C., to duty at Fort Moultrie, S. C.

Captain Horace R. Finley from duty at Camp McClellan, Ala., to duty at Fort Oglethorpe, Ga.

Captain George R. Kennebeck from duty at Carlisle Barracks, Pa., to duty at Chanute Field, Ill.

Major William D. White from duties at Fort McDowell, Calif., to San Francisco and about January 12 to Hawaiian Department for duty.

Major Harry C. Peavey from duties at Fort Adams, R. I., to Plattsburg Barracks, N. Y., about November 1 for duty.

Captain Roy C. Starr from Philadelphia to Walter Reed General Hospital, D. C., for observation and treatment.

Captain Beverly M. Mapes from duty at Walter Reed General Hospital, D. C., to duty at Fort Du Pont, Del.

Captain Roy R. Newman from duty at Camp Knox, Ky., to duty at Fitzsimons General Hospital, Denver, Colo.—*Army and Navy Register,* October 21, 1922.

Preparing for Naval Dental School

Lieutenant Commanders H. E. Harvey and Wm. L. Darnall and Lieutenant John J. Haas, dental corps, U. S. N., who have been undergoing a special course of instruction at the Northwestern University, Chicago, and in New York City, have returned to Washington and are now engaged in preparing the lecture courses for the new naval dental school which will be established at the Navy medical school in this city about the first of next year. These dental officers were detailed to Chicago and New York in order to take an intensive course to fit them as members of the dental school faculty.—*Army and Navy Register,* October 21, 1922.

KOLYNOS

DENTAL CREAM

Children with clean, healthy mouths suffer less from children's diseases, average better in their classes, and are more regular in school attendance. Repeated medical examinations have shown that mouth conditions are directly related to health and mental development.

The emulsifying and detergent properties of the neutral soap and bland chalk in Kolynos Dental Cream make it an ideal cleanser. Kolynos on the dry brush slowly mixes with the saliva and is one of the best agents for removing food debris and filth because the Kolynos foam fills the mouth and reaches remote, inaccessible regions.

Kolynos Dental Cream used morning and night destroys and washes away countless organisms in the mouth. It cleanses the teeth and it maintains a wholesome, hygienic condition in the oral cavity.

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NEW HAVEN, CONN.

What are YOUR *answers to these questions as read before The National Dental Association?*

(Replies addressed to Educational Dept., Colgate & Co. 199 Fulton St., N. Y. C., will be appreciated)

1. Can a dentifrice, be it powder, or liquid, destroy the harmful germs to be found in the mouth and not injure the teeth themselves?
2. Can any dentifrice do more than cleanse the teeth and mouth?
3. In view of the fact that a normal mouth is either neutral or slightly alkaline, and that acids injure the enamel, should or should not a suitable dentifrice be either neutral or slightly alkaline and thus in harmony with nature, rather than acid, which must necessarily act as a counter-irritant?

The doctor who read the paper went so far as to say:

"No one who has spent his life in such a splendid profession as that of dentistry can fail to note with alarm the adoption by the profession of some fad which all of his experience convinces him is bad for the patient."

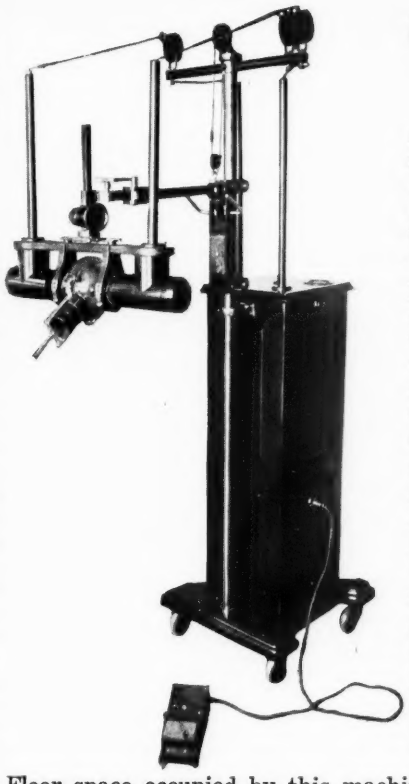
* * * * * * * * *

Among thoughtful dentists Colgate's Ribbon Dental Cream stands in high favor because

1. It is safe to use every day.
2. Its advertising carries the statement "Colgate's cleans the teeth thoroughly—no dentifrice can do more."
3. Its mild alkalinity, nearly neutral, approximates that of the normal saliva.

To sum up: COLGATE'S *Cleans Teeth the Right Way*

Truth in advertising implies honesty in manufacture.



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This apparatus enables the operator to use the standardized methods suggested by Dr. F. T. VanWoert, of New York City, so that identical positions can be accurately reproduced.

Floor space occupied by this machine 19x20 in.
Prices complete including Coolidge Tube:

Alternating Current	$700.00
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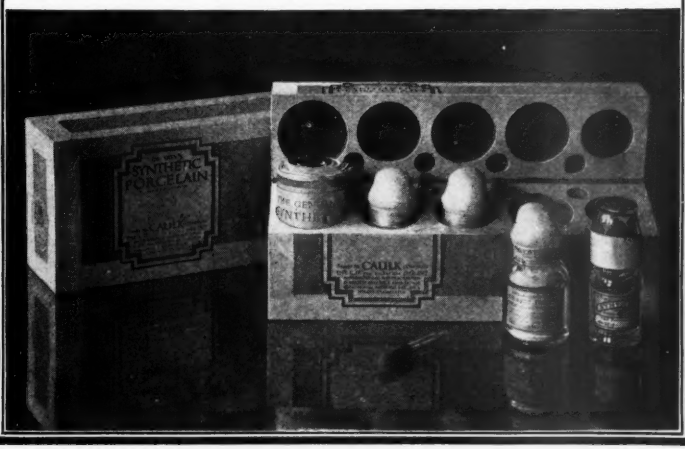

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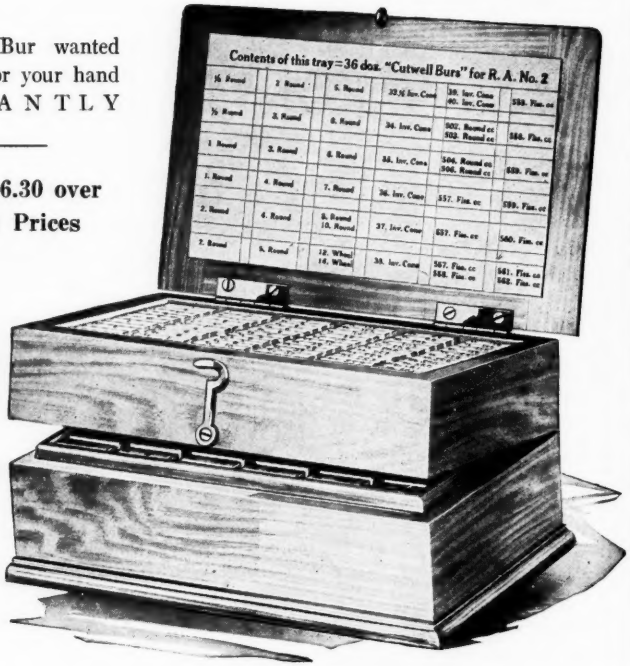

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That is what a Victor Dental X-Ray Outfit installed in your office will prove. There is nothing else we can think of that would make a better Xmas suggestion.

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Makers of the Coolidge Tube

Dental Department 236 S. Robey St., Chicago

The first ten days

In pyorrhea work—advanced cases in particular—the experience of dentists who are treating the disease with marked success by the Dentinol and Pyorrhocide Method is worth recording.

Early office treatment

Every other day, for a week or ten days prior to and during instrumentation, Dentinol is applied locally with cotton to all exposed, infected areas; and with flat-tip syringe, Dentinol is flooded to the depth of all pus pockets.

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During the same period, Pyorrhocide Powder (antiseptic) is used by the patient—two or more times daily. A brush of good design—the brushings thorough.

The object of these early applications of Dentinol and Pyorrhocide Powder is to reduce the soreness, inflammation and infection of the gums. They check bleeding. They prepare an ideal field for good surgical work.

With each recurring appointment, it will be noted that the patient's teeth are whiter and cleaner and the gums harder and firmer. Pyorrhocide Powder is medicated with Dentinol. Its effectiveness in soft, bleeding, spongy, gum conditions is very pronounced.

Dentinol is a germicidal, healing agent, designed expressly for treating oral disease.

Pyorrhocide Powder is a sterilized, remedial dentifrice, designed for every day use to promote tooth, gum and mouth health.

FREE *A copy of our illustrated booklet entitled, "Causes and Effects of Pyorrhea—Its Treatment and Prevention by the Dentinol and Pyorrhocide Method," mailed on request.*

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Zinc (Oxyphosphate) Cement
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All are zinc cements of high character varying from each other by modifications or additions, to adapt them to specific requirements.

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Ceramic Cement for porcelain work and Temporary Cement for sealing medicaments and other temporary purposes have superior qualities in their respective uses.

Directions for use with each cement

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HI-CO

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There are two valuable aids to good amalgam work with True Dentalloy and they are S. S. White Mercury and the S. S. White Mortar and Pestle No. 8. Good fillings are made without them, to be sure, but you are likely to find them an improvement over anything you have tried.

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Now about the Mortar and Pestle. We introduced an improvement in mortars by which the time of triturating can be reduced and the mix can be made thoroughly with little exertion.

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Try this Combination

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An arbitrary requirement in crown and bridgework is mechanical ingenuity). Regardless of how ingenious the workman is, perfected materials not only simplify the technic but protect the workman.

Steele's Interchangeable Teeth are as perfect as man and machine can make them, in maintaining absolute standards of interchangeability). For this reason they are generally used in crown and bridgework. The accurate interchange between molds protects the workman as well as the patient. There is no possibility of destroying a perfect fitting bridge in replacing a broken tooth, or changing shades.

The case used in illustrating this page — one anterior fixed bridge and two removable bridges, was submitted in the 1921 Prize Contest by

ZILINSKI & STERNBERG
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The correct technic for the use of *Steele's* together with "The Book of Bridges" illustrating 81 cases, and the Technic for Porcelain Root work will be sent on request.

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IN the family of proteid silver preparations Neo-Silvol makes a strong bid for distinction. The scales themselves are white in color, and solutions have a milky opalescent hue. This naturally means that you can apply effective silver medication without staining everything within reach with the characteristic dark-brown color of other silver salts. Chemically, it is a colloidal form of *silver iodide.*

Silvol, the dark-colored silver proteid that has become a standby in the practice of many dentists, is, on the other hand, a colloidal form of *metallic silver.* This explains the difference in color.

Therapeutically, Silvol and Neo-Silvol are on a par. They are indicated in solutions of 2% to 30% in the local treatment of inflammations of the buccal mucous membrane, and as applications to carious teeth, pyorrhea pockets, and post-extraction sockets.

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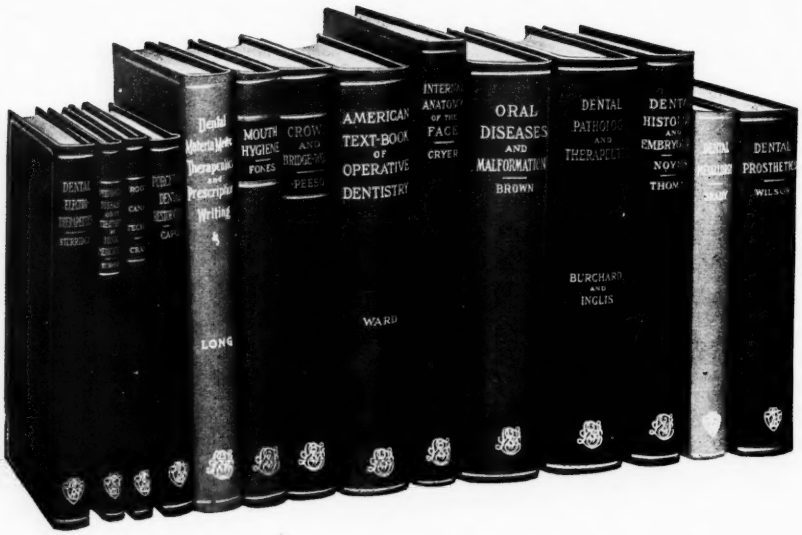

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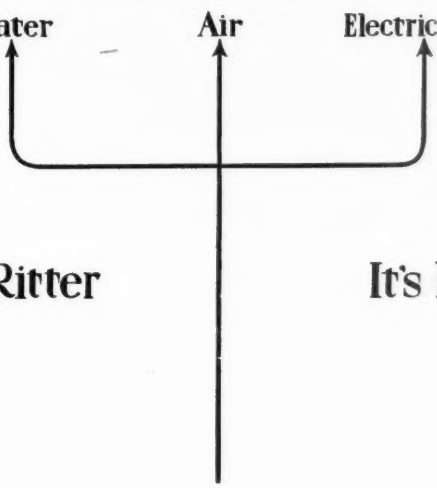

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Equipment ready for Delivery in January.

Ritter Dental Manufacturing Company, Inc.

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You'll Advise It

When you know the facts

Pepsodent holds the leading place in the dentifrice field today.

Modern authorities approve it. Millions of people now employ it, nearly all the world over, largely by dental advice. That is the result of seven years of tests, investigations and watching of results.

Its distinctions

Practically every former dentifrice was alkaline in character, based on soap and chalk. Modern research shows that alkalis bring undesired effects. They depress the salivary flow. They reduce Nature's tooth-protecting agents in the mouth. Pepsodent omits all alkalis, all soap, all chalk. It is mildly acid. Thus it stimulates the salivary flow and reduces its viscosity.

It increases the ptyalin in the saliva —the starch digestant—to better combat starch deposits on teeth. It increases the alkalinity of saliva, which is there to neutralize mouth acids.

It also combats the mucin plaque in two effective ways.

Seen every day

Nearly every dentist every day sees the benefits of Pepsodent. Most of them realize that it means better tooth protection. All of them know that modern authorities approve its principles.

But Pepsodent so differs from old-time tooth pastes that it leads to many questions. Our experts have worked for years to answer them correctly. Refer them to us when they occur to you. We publish scientific bulletins, brief and authoritative. We issue a Pepsodent Questionnaire. And we send a tube for chair tests to any dentist who will mail the coupon.

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The Modern Dentifrice

A scientific tooth paste, mildly acid, which brings five desired effects.

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Please send me, free of charge, one regular 50c size tube of Pepsodent, with literature and formula.

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HALITOSIS

(AS DEFINED IN THE CENTURY DICTIONARY)

(Hal-i-to-sis) N. N. L.

(L. Halitus—Breath .:. Osis—Offensive)

Offensive breath, whether arising from diseased or neglected conditions of the teeth, mouth or nose or caused by disorders of digestion, respiration, the excessive use of tobacco, etc., may be readily overcome by the deodorizing properties of—

LISTERINE

Listerine is strictly antizymotic, it inhibits alike the acid fermentation of carbohydrates and the alkaline putrefactive processes of mixtures of meat and saliva, retained as debris about the teeth; hence, Listerine is antagonistic to the activating enzymes of fermentation so often the cause of Halitosis.

Many dental practitioners who advise their patients to use Listerine daily as a mouth-wash, also keep Listerine in an atomizer on the dental bracket readily available for use prior to operations, in self defense against pronounced cases of Halitosis.

Lambert Pharmacal Company

Twenty-first and Locust Streets **St. Louis, Mo., U. S. A.**

HARDENS SOFT TEETH

Formula of W. M. Ruthrauff, A.B., A.M.,
Inventor of the first Acid Tooth Paste.

Hundreds of experiments prove that when the saliva is rich in calcium phosphate, tooth decay is rare. On the other hand when the saliva is deficient in calcium phosphate, tooth decay is extremely common.

It required seven years of scientific research to discover how the saliva possesses not only a hardening or calcifying action on the enamel but also a reparative action in counteracting the destructive forces constantly active in the mouth and to develop a Tooth Paste having marvelous calcifying properties to supply the deficiency in the saliva.

Teeth Loose Sensitiveness Under This Treatment

Teeth that are sensitive to heat or cold, sweets or acids, will in a short time lose this sensitiveness as the porous surfaces become hardened or calcified. Calcified teeth acquire a characteristic polish and luster which it is impossible to impart to soft chalky and porous teeth, until they have become calcified.

Your Patients will ask you about this new Calcifying Tooth Paste ACIDENT and you should know the theory upon which it is based. Send for free samples and literature today.

W.M.RUTHRAUFF COMPANY
Twenty Second & Arch Streets
PHILADELPHIA, U. S. A.

W. M. RUTHRAUFF CO., Dept. 54

Kindly send me literature and three 50c tubes of ACIDENT Tooth Paste, free of charge. Professional card is attached.

Name ..... Dentist Physician

Address .....

City & State .....

A MASTERPIECE

An American Creation

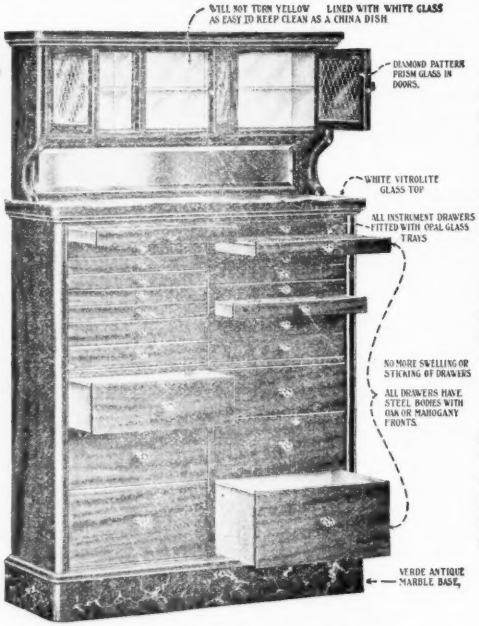
THE LAST WORD IN DENTAL CABINET CONSTRUCTION.

A BEAUTIFULLY FINISHED PIECE OF FURNITURE

PRISM GLASS IN DOORS, MORE EXPENSIVE BUT MORE BEAUTIFUL.

ONE LAP AHEAD OF ANYTHING ELSE ON THE MARKET.

IN THE FOREFRONT BECAUSE IT'S AMERICAN.


WILL NOT TURN YELLOW — LINED WITH WHITE GLASS AS EASY TO KEEP CLEAN AS A CHINA DISH
DIAMOND PATTERN PRISM GLASS IN DOORS.
WHITE VITROLITE GLASS TOP
ALL INSTRUMENT DRAWERS FITTED WITH OPAL GLASS TRAYS
NO MORE SWELLING OR STICKING OF DRAWERS
ALL DRAWERS HAVE STEEL BODIES WITH OAK OR MAHOGANY FRONTS.
VERDE ANTIQUE MARBLE BASE.

ENTIRELY NEW, GLASS MEDICINE-CLOSET MADE IN ONE PIECE.

SANITARY WHITE GLASS WORKING TOP.

DRAWERS CANNOT SWELL OR STICK AS BODIES ARE MADE OF METAL.

OPAL GLASS TRAYS USED THROUGHOUT AS THEY ARE ABSOLUTELY SANITARY.

No. 120 Cabinet Showing Special Features

At Last The Perfect Cabinet

Positively nothing newer or better can be found on the market than this new American Creation.

Its special features and beautiful lines make it a radical departure from ordinary dental cabinet practice.

Of course it costs a little more than an ordinary cabinet but it will make a very favorable impression on your patients.

A real achievement in Dental Cabinet designing.

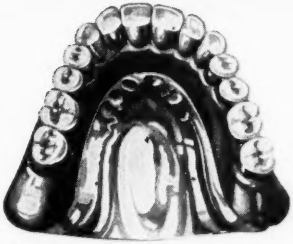
Write us for a more detailed description.

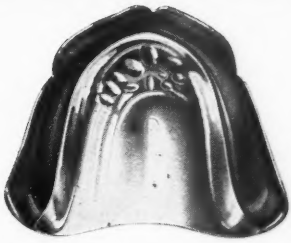
The American Cabinet Co.

Two Rivers, Wis.

A Gold Plate for $25

The Duplex Denture





WE ARE getting orders and reorders from all parts of the country. One Ohio dentist ordered five Duplex Dentures within ten days. Such remarkable demands are the natural outcome of unusual value and we are confident a trial order for this plate will eventually add your name to our long list of regular patrons.

Description—

The entire palate is of gold. A series of retentions embedded in the vulcanite form a secure anchorage and at the same time permit a beautiful finishing line between gold and vulcanite on both palatal and lingual surfaces.

The periphery of muscle-trimmed impression is accurately reproduced in the vulcanite, thus securing the "valve" peripheral fit with the rubber—a result almost impossible with metal. When necessary the periphery can be trimmed without impairing the fit of the plate.

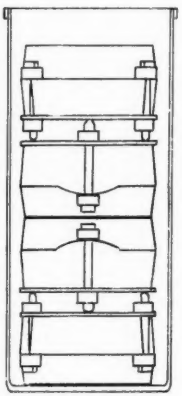
Price for entire plate, $25.

This comprises full upper complete, including gold, Trubyte teeth, granular gum, ash rubbers and trial. Send perfect impression and bite. We will send the gold base, with teeth set up in wax to be tried in the mouth before vulcanizing.

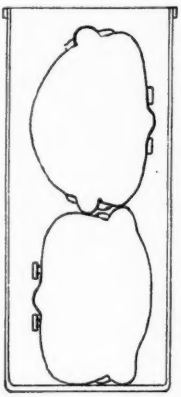
The BERRY
Dental Laboratory Co.

Equitable Building—St. Louis, Mo.

ANOTHER ONE



4 №18 Flasks



2 Hall Flasks

For the convenience of those who are using the Injector type of flask, or who wish to vulcanize a larger number of cases than usual, we announce the introduction of the FOUR CASE, 4½ inch LEWIS VULCANIZER.

The outline cut at the left shows the manner in which two Hall Precision Flasks, or four No. 18 Flasks can be accommodated in this new pot.

It will also handle 3, No. 13; 5, No. 1, and four each Nos. 2-R-7-20-R-or 24. Also four of the new LEWIS HOWELL Flasks, a very modern type of the Injector Flask.

It can be supplied with Gas, Alcohol or Kerosene Heaters, and is a Lewis machine in every way.

PRICES:—No. 4, 4½ inch Lewis Vulcanizer complete with 4, No. 18 Flasks.

GAS	ALCOHOL	KEROSENE
$50.00	$52.00	$53.00

When desired, the No. 4 pot and jacket may be substituted for No. 2 or 3 already in use; all parts of LEWIS VULCANIZERS being interchangeable.

No. 4, 4½ inch Pot and Ring only	$23.00
No. 4, 4½ inch Gas or Alcohol jacket	2.10
No. 4, 4½ inch Kerosene jacket	2.25

BUFFALO DENTAL MANUFACTURING CO.

TRADE BUFFDENTCO MARK

BUFFALO, N. Y.,
U. S. A.

Booklet illustrating and describing Dr. Hall's method—free on request.

S. S. White
Impression Tray Compound

The modern and surest way to get a perfect impression is to make an individual impression tray for every case, using S. S. White Impression Tray Compound.

You simply warm enough of the material, and while it is plastic, take an impression with it. When cooled at ordinary temperatures the tray made of our compound is hard and brittle,—can be carved and trimmed to a thin edge. With this perfect fitting tray the details of any case can be recorded in a thin layer of plaster covering it.

Box of Eight Cakes $1.10

At Your Dealer's

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

PHILADELPHIA, PA.

Sold One Color or Assorted

(Pink and White)

At Your Dealer's

S. S. White Tooth-Tint Temporary Stopping

As a Medicament Seal

As a Gum Retractor

is unsurpassed in quality;

is unequaled in color

S. S. White
Gutta-Percha Stoppings

Pink White Tooth-Tint

Full ounce box $0.50

Six boxes 2.40

NOVOCAIN

(Procain - Metz)

The Frequent Users'
Economy Packages

The New Style hermetically sealed bottles of 100

N. S. Tablets "E" and "T"
$1.20 per bottle
Box of 10 bottles $10.00

For two per cent solution, dissolve one N. S. tablet "E" or one N. S. tablet "T" in one cc. Ringer solution.

The N. S. tablet "E" is preferable for mandibular injections and for anesthesia when pronounced ischemia is desired.

The N. S. Tablet "T" is preferred for anesthesia in non-surgical procedures in patients suffering from anemia, arterio-sclerosis and cardiac disorders and also in the very young and in the aged.

H.A.METZ LABORATORIES, Inc.
One-Twenty-Two Hudson Street, New York.

Manufacturers of NOVOCAIN "The Dependable Original"

Don't Forget to Say
S.S. White Paper Disks

When you order paper disks, it is a simple matter to specify the name of a product that will give you satisfaction. S. S. White Paper Disks are made and sold in greater quantities than ever, and the reason is in their quality.

There is no more excuse for slighting the manufacture of paper disks than for making poor and inefficient instruments. Both are used by men whose time and skill are their chief assets—anything short of the best tools is just that much of a handicap.

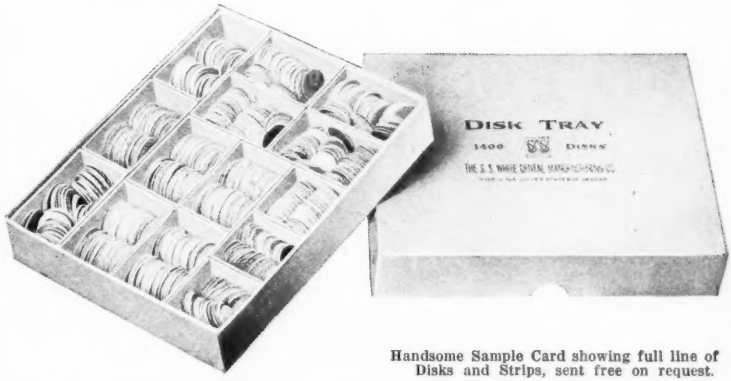
That's the way we feel about paper disks. S. S. White Paper Disks are made of the finest abrasive papers, cut clean and circular, with holes punched centrally, and they are coated on the reverse side with shellac to stiffen them and protect them from moisture.

Try the 1400 Assortment
S. S. White Paper Disks

Price $2.00

At Your Dealer's

Paper Disks
in Boxes
of 100
Price 15c



Handsome Sample Card showing full line of Disks and Strips, sent free on request.

There is no oil nor glycerine in Revelation

Revelation Tooth Powder has never been made in paste form. Nearly all pastes are made with glycerine or oil.

Oil is not miscible with the saliva and consequently of no prophylactic value. Pastes often contain 25 to 30 % glycerine, which should not habitually be applied to the gums.

The highest authorities state that glycerine is a depletent—that it draws the natural moisture from the tissues. So, not knowing of any other excipient, we have concluded that the powder form is the best for Revelation.

Try the powder yourself at the chair, and you will find that it positively dissolves plaques and also polishes the enamel; its daily use keeps the teeth and gums in a clean and healthy condition and the enamel highly polished.

A test of Revelation proves this.

We will provide the means for the test: a full-sized can of Revelation.

Please send a note on your professional stationery, or just your professional card will do.

August E. Drucker Co., 2679 California St., San Francisco, Calif.

REVELATION

TOOTH POWDER

MAKE YOUR SMILE A *REVELATION*

Dioxogen

H_2O_2

In the treatment of pyorrhea and Vincents Infection Dioxogen one-half strength is very effective.

Used as a preliminary mouth wash it destroys the pus that constantly exudes from pyorrhea pockets, dissolves coatings and coverings, removes gum irritants, eliminates offensive odors and prepares the way for other treatment.

Where destruction of gum tissues has occurred and home treatment is required in the intervals between office visits, Dioxogen may be used by the patient without the mutilation of the gum tissues that a toothbrush causes and without pain.

Dioxogen destroys the organisms that cause these diseases and when systematically used by the patient it creates and maintains a degree of cleanliness without which it is impossible for the dentist to do successful work.

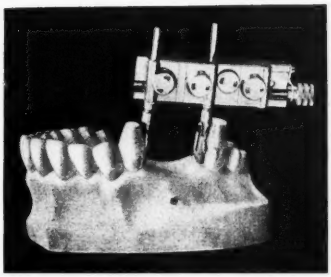
THE OAKLAND CHEMICAL CO.

59 Fourth Avenue New York

I saw a weaver seated at his loom,
And as he worked, the weaver crooned a tune;
Hard by the loom some threads discarded lay,
They were the snarls - mistakes of yesterday.
And there were threads by far a brighter hue,
They were of hope - the threads of prospects new.
I saw the weaver choose the threads with care,
Slowly he wove them in a pattern rare;
Some threads appeared in bold relief and free -
High lights were they in Life's bright tapestry.
You are the weaver of your future days,
Sing as you weave - success will reign always.

The Season's Best Greetings

Chayes System Laboratories, Inc.
New York City

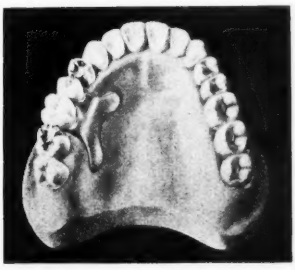


Checking Up Parallelism.

These are two of
Thirty-one half-tone
Pictures, showing the
Construction of a

"CHAYES"

Movable-Removable-Bridge
From Study Model to
Completion, and
Contained in a book
Illustrating the entire
Technique.



Completed Bridge.

Charts showing
Cavity Preparation
In teeth used as
Abutments also appear
In this book.

No man doing
Restorative work
Can afford to be
Without this book.

Fill out the coupon below.

.....1922.

CHAYES SYSTEM LABORATORIES, Inc.
7 West 45th St., New York, N. Y.

Dear Sir:

Enclosed find $1.50 for Manual on the Construction of a Chayes Bridge.

Name .....

Address .....

City .....

PROPHYLACTIC TOOTH POWDER

We have on our list as prescribers of PROPHYLACTIC TOOTH POWDER the big men in ORTHODONTIA.

This means a great deal because a clean mouth in ORTHODONTIA is the first essential.

The ORTHODONTIST has learned that the one dentifrice which will keep children's teeth clean without injury to the enamel is PROPHYLACTIC TOOTH POWDER.

Any dentist or registered nurse can obtain a sample can on request. If you have not tried PROPHYLACTIC TOOTH POWDER do so and appreciate why it is being used and prescribed by the ablest men in dentistry.

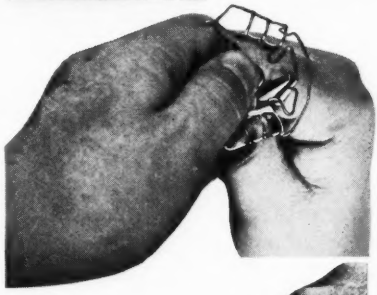
Prophylactic Tooth Powder, Inc.

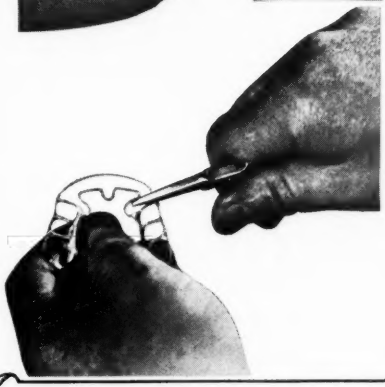
Manufactured and distributed by

Schieffelin & Company

170 William Street, New York City

Established 1794





Adjustments are Easy!

To spread the appliance in the bicuspid region hold the appliance as shown and increase the space between the anchor bars by rotating a broad, flat instrument to increase the spread between main spring and forward end of anchor bars. This is done alternately from side to side.

The next step is to allow for the increased spread of the mainspring by elongating, or flattening out the center loop of the inside front wire as shown. This permits this spring to help the mainspring in its spreading action instead of holding it back.

The final movement in this adjustment is to allow for the spread of the anchor bars by partially flattening out the loops on either side of the outside front spring in the cuspid region. Unless this wire is elongated it will resist the spreading action of the mainspring.

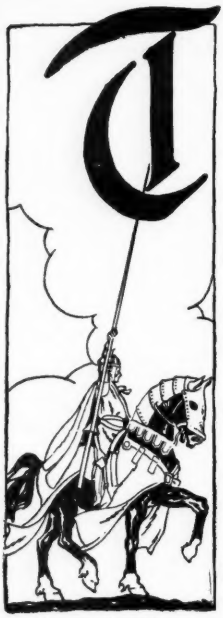
The base of the front arch must be broadened to nearly its proper width before the rotation and lining up of the incisors is started. This broadening is easily accomplished when the proper adjustments are made.

For Further Information Write

The Bacon Manufacturing Company

LaSalle Building, Minneapolis, Minnesota

Get Results by Advertising in THE JOURNAL



Truth

What the manufacturer says about his own product is not nearly so important nor authoritative as what the **user** says about it.

We -- or any other manufacturer -- could hardly be expected to speak other than favorably. That's human nature.

It is the outside, unbiased viewpoint that yields the real truth.

Certified Enamel was developed for us, under our Fellowship in the Mellon Institute of Industrial Research.

1031 members of the profession -- the famous Committee of 1000 -- were asked to test the material in the mouths of their patients for the period of a year. Clinical records of their cases were furnished us. These records were audited by three ex-presidents of the National Dental Association.

The nature of their report -- published broadcast at the time -- resulted in our marketing Certified Enamel.

And the profession has, by the overwhelming voice of demand for Certified Enamel, confirmed the findings of their colleagues.

What the manufacturer says isn't nearly so important as what the user says.

If you were a manufacturer wouldn't you be prejudiced in favor of your own product?

Can you as a **professional man** be trusted to place the true valuation upon the products you use -- can your colleagues be similarly trusted?

Lee S. Smith & Son Mfg. Company
Pittsburgh, U. S. A.

Certified Enamel may be purchased from good dealers everwhere.

CERAMIC LABORATORIES.

These Laboratories excel in:—

LOCHHEAD

1—Jacket Crowns.

2—Porcelain Bridges consisting of a Jacket Crown with dummy attached and metal rest to reduce the liability of fracture to the minimum.

3—Porcelain Root Extension using Steeles Interchangeable Facing with angle Backings or Cast Stumps with Porcelain coping.

4—Porcelain Inlays.

5—Gold Casting, Inlays, Stumps for Jacket Crowns, Carmichaels, Attachments, etc.

6—Staining of teeth and crowns—Addition of gum porcelain.

Laboratories, Inc.

We are Specialists in Ceramic Dentistry. Dentists who desire beauty in hand carved crowns will appreciate the results of these Laboratories. We are always pleased to give advice or suggestions. Literature sent on request.

THE LOCHHEAD LABORATORIES, Inc.

New York	Boston	Chicago
114 West 44th St.	120 Boylston St.,	25 E. Washington St.

BUTYN

REG. U. S. PAT. OFF.

THE SPEEDY ANESTHETIC
YOU HAVE BEEN HOPING FOR

HAVING all the speed and power of cocaine, but without cocaine's narcotic restrictions, **BUTYN** excels also in the greater intensity and longer duration of its anesthesia, in more rapid healing and less afterpain, and greater convenience.

INFILTRATION & NERVE-BLOCKING—
Use No. 1329 BUTYN & EPINEPHRIN Comp. Bottles of 100 tablets.....$1.55
One tablet in 1 c.c. distilled water makes 1% solution. No Ringer's solution necessary.

PRESSURE ANESTHESIA—
For pulp extirpation use No. 1354 BUTYN PRESSURE SOLUTION,
¼ oz. bottle $2.50
A special 25% solution of BUTYN produces immediate anesthesia of the pulp by usual pressure method.

BUTYN, 3 gr. tablets
Tubes of 10 .....$2.15
Without epinephrin or isotonic salts. For making solutions of any desired strength.

TOPICAL APPLICATION—
Use No. 1344 ANAPAYN
Per ½ oz. jar $1.65
Massage into gums to prevent pain in making hypodermic injections, scaling, lancing abscesses, cleaning out pyorrhea pockets, etc.

PAINLESS CAVITY PREPARATION—
Use No. 1353 PAYNEX
¼ oz. bottles $3.35
For the immediate desensitization of hypersensitive dentin by direct application to the cavity. No 24-hour wait after application.

BUTYN powder, 5Gms.....$5.06
25Gms.....$24.00
For topical applications and for making solutions.

THE ABBOTT LABORATORIES
Home Office, Dept. 129, CHICAGO

New York — Toronto — Los Angeles
San Francisco — Seattle — Bombay

For Prices in Canada, apply to our Canadian Branch, 57 Colborne St., Toronto.

Send this order to your Dental Dealer

Please send me the following Abbott, preparations:

100 tablets BUTYN & EPINEPHRIN Comp. $1.55
¼ oz. Bottle BUTYN PRESSURE SOLUTION $2.50
10 Tabs. BUTYN grs. 3.....$2.15
Jar ANAPAYN $1.65
¼ oz. bottle PAYNEX.....$3.35
BUTYN powder, 5 Gms.....$5.06
"THE STORY OF BUTYN" Free.

Dr. .....

Address .....

.....

WOULD YOU LIKE TO INSERT THIS SORT OF PARTIAL?

No binding between abutments
Comfortable at insertion
Fifteen minutes average time for insertion
Leaning teeth do not interfere
Very little after trimming
No after trimming in many cases
Abutments do not become sensitive
Resorption is reduced
Denture has benefit of adhesion after resorption
No danger from stress or moving clasps.

15,000 PARTIAL DENTURES

fitted with Dresch Attachments are now in use. They prove that Dresch Attachment dentures possess all the above features. That is the reason users of Dresch Attachments are so enthusiastic about them; the reason for hundreds of clinics before local, State and National Societies; the reason users construct more partials than before.

When a Dentist inserts his first Dresch Attachment case he goes gunning for partials.

Dealers everywhere have Dresch Attachments and all the better laboratories apply them. Or send direct for descriptive literature and directions.

THE DRESCH LABORATORIES COMPANY

622 Madison Ave., Toledo, Ohio

To Dissolve Mucin is the Highest Aim of any Dentifrice

Since the recent discovery of Mu-Sol-Dent, the remarkable mucin solvent, at the Mellon Institute of Industrial Research, a number of dentifrice advertisers have been laying stress on the mucin solvent properties of **their** preparations.

The manufacturers of these preparations have long been aware of the necessity of removing mucin **by chemical action** in order to clean teeth thoroughly. They know that the dental profession ultimately will prescribe that dentifrice which is the best mucin solvent.

Two-Minute Limit Essential

There has never been any difficulty in finding mucin solvents. The difficulty, rather, has been to find a solvent which would accomplish its work in less than two minutes, and do it without injuring the enamel or oral tissue. To have any practical value, a dentifrice must dissolve mucin **in the brief space of time consumed by the average person in cleaning his or her teeth.**

Mu-Sol-Dent dissolves mucin in less than 2 minutes. It is the first and only mucin solvent to accomplish its work in anything approaching such a short space of time. Beyond this, it has demonstrated high therapeutic properties. Hence the unique value of the discovery.

Mu-Sol-Dent

IT DISSOLVES MUCIN

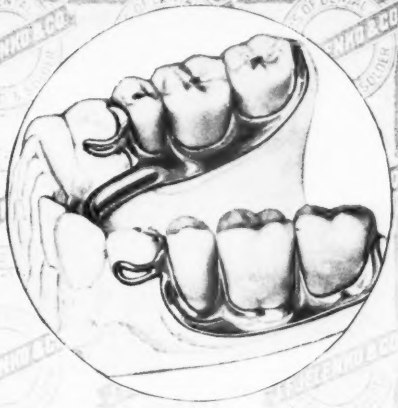
Make 2-Minute Test at our Expense

The V-B Corporation, Dept. O, Pittsburgh, Pa., will send you free Sample Bottle of Mu-Sol-Dent, and full directions how to test the Mucin Solvent properties of this and any other dentifrice in 2 minutes.

Name .....

Address .....

Please attach Professional Card.



A Perfect Combination

A Jelenko Ready-Made Lingual Bar, saddles (posts included) cast of Skel-cast and the new Jelenko patented ready-made clasps.

The technique and artistry of your laboratory work, in final analysis, depend upon the working quality and the durability of the gold and the gold products that you use. Jelenko specialties are recommended and sold by better dealers everywhere.

J.F. JELENKO & Co.
136 West 52nd. St. New York, U.S.A.

The Bosworth Efficiency Bookkeeping System

A simple record keeping system for Dentists that will positively take up all the lost motion and put any practice on an increased production basis with less physical effort — ANY GRAMMAR SCHOOL GRADUATE CAN KEEP THIS SYSTEM.

READ WHAT A USER OF SAME SAYS:

R. V. JOHNSON, B.S., D.D.S.
201 East 37th Street,
Chicago, Illinois.

August 12th, 1922.

Harry J. Bosworth Company,
1105 Tower Bldg.,
Chicago, Ill.

Gentlemen:

I want to tell you of my success with the BOSWORTH EFFICIENCY SYSTEM. Your Efficiency Man installed the system on June 20th, putting me on a basis of $40.00 per day or $10,000.00 per annum. I experienced an increase in my income at once. From January 1st to July 1st of this year, my average income per month was $423.00. With the assistance of the BOSWORTH SYSTEM my business for July was: Fees, $1087.00; Collections, $1066.00 and still going. I did $275.00 the first five days of this month. By a method worked out by your Efficiency Man a number of my old patients were brought back to my office and I contracted for dental work with fifteen of the first sixteen of the old patients brought back.

I cannot recommend your SYSTEM or your SERVICE too highly. Wishing you success in your wonderful work,

I am, Yours very truly,
R. V. JOHNSON.

We have thousands of letters from satisfied users of the system and applications of the "Bosworth Plan."

Price $75.00 complete including time stamp.

Terms $25.00 cash with order and $10.00 per month.

GENUINE BOSWORTH LIGHT

For a time we will sell this popular light at a price any one can afford to buy. These lights need not be confined to the operating room. They give a beautiful white light without a glare. Price now $17.50, in black enamel. White, gray and mahogany $2.50 extra

Price Now $17.50

SKULLS
$ 25.00

We have a big assortment with 32 teeth in perfect occlusion. If you want a specimen with any special markings we can furnish it. We will send several out for selection.

HARRY J. BOSWORTH CO., Chicago
OUR NEW ADDRESS: 9 North Wabash Ave. near Madison Street.

A Small Thing to Buy If You Never Need It.

"Gentlemen:

Just arrived home and hasten to enclose check for renewal. Would not be without such protection. Eternal vigilance against a suit affords a happy frame of mind that more than makes up for the cost.

Yours truly,"

"Gentlemen:

Enclosed find check; cannot afford to be without such contract, although I have practiced 25 years and never had a suit, yet the satisfaction of security is worth many times the amount asked.

Sincerely,"

"Dear Sirs:

I have carried a policy in your Company for many years without needing it but I am mighty glad to have it.

Very truly yours,"

"Gentlemen:

Enclosed find check. As yet we have never had a threat of law-suit but certainly feel the sense of security your policy affords us. The moral effect can be appreciated by anyone.

Respectfully,"

"Gentlemen:

Enclosed find check for current year's protection. I believe this is my 20th year. During these years, only once have I had a scare. I wouldn't live without your contract.

Yours truly,"

A Big Thing to have By, if You Ever Need It.

"The Medical Protective Company,
Fort Wayne, Indiana.

Gentlemen: I wanted to write to you the minute the foreman announced the verdict of the jury, "Not Guilty."

I have no words to express my appreciation of the way in which my case was handled from beginning to end. I am thoroughly pleased in every respect, and you can count on me to belong to your company as long as I practice.

The plaintiffs had an ex-judge for their attorney, and he certainly made a fight to win, but the ability of your attorneys certainly won the jury to our side.

Let me congratulate and thank you for the high class, capable handling of our case.

If there is a Doctor who is doubtful about getting your insurance, refer him to me, and I will assure you that you will have another patron.

I thank you again for all the courtesies and kindnesses extended.

Very sincerely yours,"

For Medical Protective Service
Have a Medical Protective Contract

The Medical Protective Co.

of

Fort Wayne, Indiana

WHY?

WHY should you, or why should anybody, attempt to make uniform castings by the carbonization or volatilization methods in the face of the following odds:

Plaster of Paris owes its strength to its water of crystallization. When subjected to heat this water of crystallization is driven out of the plaster in the investment in the form of steam; and the investment loses its strength.

It requires only 212° to 300° F. to dehydrate plaster about seventy-five per cent, and 400° will cause marked disintegration.

How, then, can perfect castings be expected from molds that have been subjected to the great heat necessary in the carbonization or volatilization methods, the latter requiring as high as 900° F.?

How can uniform castings be made in molds that have become disintegrated and unequally expanded?

This is only one feature of the many of equal importance that are discussed in the booklet, "A Standardized Inlay Technic", by Dr. K. W. Knapp, a copy of which we will gladly send you on request.

You will find it filled from cover to cover with sound logic, clearly stated.

Send for your copy today

M. F. PATTERSON DENTAL SUPPLY CO.
406 Sixth Ave. So.
MINNEAPOLIS, MINN.

Synthay Porcelain!

A Master Silicate

Developed and perfected by
N. K. GARHART,
himself.

No Royalties to Pay!
80% More Powder!
100% More Liquid!

A MASTER in proven QUALITY!

A LARGE reduction in PRICE!

We point with pride to its REMARKABLE selling record!

15 Standardized Colors

Single color complete package ..... $ 3.50
6-color complete package 15.00

MEDIUM

60% Silver Shavings

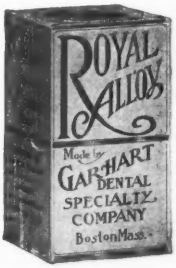
A. M.

After much deliberation you will have to admit that QUALITY is not present in HIGH prices and SMALL portions. The art of propaganda would try to make you think otherwise.

PRICES

5 ozs.....$10.50	10 ozs.....$20.00	25 ozs.....$45.00
Cash.....$10.00	Cash.....$19.00	Cash.....$43.00

BALANCED



67% Silver Filings

Garhart Dental Specialty Co.
Somerville, 42, Mass.

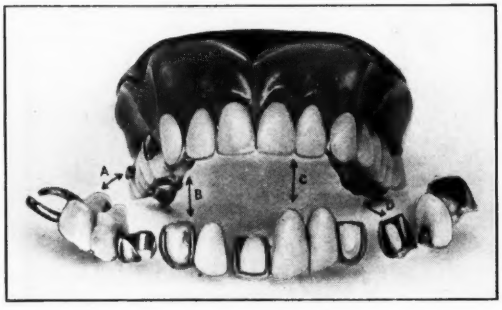
Also direct service from Los Angeles, Cleveland and New York City.

HAVE YOU YOUR COPY OF "DENTAL FILLING ALLOYS?" IF NOT WRITE TO US.

BETTER DENTISTRY

ORAL ART SERIES NO. 24

Porcelain Roots - Tips and Saddles



A—Bicuspid and molar with highly glazed saddles of Porcelain—clasps for retention.

B—Lateral facing is pin removable with cast backing ¾ crown for retention.

C—Central and lateral with porcelain roots, central and cuspid ¾ crowns for retention.

D—Second bicuspid with porcelain tip and approximal lug to permit the accurate seating of inlays, ¾ crowns on bicuspid and molar for retention.

BRIDGES CONSTRUCTED with highly glazed porcelain in contact with tissue — interproximal spaces — cast gold occlusal, produce the highest esthetic results.

OFFER the greatest possibility of retaining gingival alignment and are a reproduction of the natural teeth on the lingual as well as labial and buccal.

PORCELAIN ROOTED BRIDGE TEETH for cases requiring extraction.

PORCELAIN TIPPED BRIDGE TEETH for cases not of recent extraction.

PORCELAIN SADDLES for removable cases with clasps or attachments for retention.

Take wax bite and separate impression of upper and lower with abutments in position and send with shade desired.

RESULTS OBTAINED ARE MOST BENEFICIAL.

WE OFFER YOU the advantages of our twenty years' experience in PORCELAIN construction—our organization of over one hundred and thirty people—skilled and experienced in every department—with an equipment that cannot be excelled—will produce results for you.

We receive orders from every part of the United States. RAILWAY MAIL helps us to give you service. All lines lead to Minneapolis.

HENRY P. BOOS

DENTAL LABORATORY

608 Nicollet Avenue. **Minneapolis, Minn.**

BLACK MARGINS ELIMINATED!

Why not be sure that your cement work will always retain that bright, clean appearance that it has when it leaves your hands?

Place your inlays, etc., with an insoluble cement that is guaranteed not to discolor. Practically all of the dental cements offered you contain bismuth. Bismuth unites with the sulphides of the saliva, and forms bismuth sulphide which is black.

Bismuth itself has no cementing value. It is put in as a flux to decrease the time required to calcine the Cement powder. Since it has no value, why use a Cement containing bismuth, when you can obtain a cement that has eliminated the need of this element.

S-C CEMENT contains no sodium, no bismuth. Its powder is finer than talcum, making it easy to mix. Properly mixed, it developes practically no heat and when set resists a pulling force of over 300 pounds per square inch.

The coupon will enable you to try it.

Send me
through
my dealer
1-1 color box
of S-C CEMENT

Name.....

Address.....

Dealer.....

Stratford-Cookson Company
42nd & Ludlow Streets,
Philadelphia, Pa.

The Supporting Power

The value of a magazine as an advertising medium depends to a great extent on the power supporting it.

The proprietorship of THE JOURNAL is backed by 33,500 active, energetic dentists--professional men in every state in the Union, who take pride in their publication. They are patrons of and boosters for its advertisers.

These factors insure the advertising force of

THE JOURNAL

The Official Mouthpiece of Organized Dentistry

Published Monthly by

AMERICAN DENTAL ASSOCIATION

ALCOHOL, 2% BY VOLUME
Sodiphene
"First Aid for the Family"
More than a
ANTISEPTIC
also a
GERMICIDE
Dilute ~ 1 PART Sodiphene to 3 PARTS WATER for a Daily Mouth Wash and Gargle
For Sore Throat Tonsilitis & Cold in the Head. Aids in healing cuts, burns & bruises and such pain
Insect Bites, Sunburn and Poison Ivy. For external use only. Keep out of eyes. Read directions & booklet
Inert Ingredients: Water 94.74% Alcohol 2%
SODIPHENE CO.

This Germicide Will Meet Difficult Tests

Dentists who have asked Sodiphene to meet only the requirements of an Antiseptic, are urged to put this Germicide to difficult tests, tests which just an Antiseptic will not pass successfully. Sodiphene is a sage Germicide not only for the dental office but for use in the home, in conjuction with the dentist's treatment. It has a phenol base, but with all irritating qualities eliminated.

Sodiphene will be found of great value when used after extraction, in the treatment of Vincent's Angina (Trench Mouth), and as a destroyer of pus. And the dentist can confidently recommend it to his patients as a daily mouth wash and gargle to keep the teeth, gums and throat in a healthy condition, and for Sore Throat and Tonsilitis.

If you have not given Sodiphene a thorough trial, write at once for a professional package.

THE SODIPHENE COMPANY

926 Central St., Kansas City, Mo.

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As manufacturers of Cottonoid (Felted absorbent cotton) and other Aseptic Absorbent Preparations we have for some years put up and marketed a package of surgically clean imported bibulous paper. This package we shall continue to supply although the cost of this imported paper has recently gone so high as to be almost prohibitive to its general use.

With these conditions before us we wish to call the attention of the dental profession to the many advantages of Cottonoid over Bibulous Paper.

Cottonoid is the best general dental absorbent that we know how to produce and the most convenient in form. It can be used in single thickness in small rectangles or ovals cut to any desired size or in folded pads. It can be cut in small squares as a napkin or cut in small blocks for drying cavities. It can be cut in strips across the sheet, pulled off and quickly twisted into pellets more easily than paper.

Further than this in point of cost it is many times cheaper than Bibulous Paper. The same amount of money invested in Cottonoid will give you ten times the absorbent bulk and *soak up ten times as much moisture.* Try it and see! Ask your dealer for Cottonoid.

Sold by leading Dealers in Dental Supplies in every country in the world.

JOHNSON & JOHNSON
New Brunswick, N. J., U. S. A.

Immunity Steel

THE INSTRUMENTS OF SATISFACTION. THEY POSSESS 4 ESSENTIALS

RUST-PROOF - ACID-PROOF - HEAT-PROOF

AND

UNSURPASSABLE STRENGTH

Demand "Hu-Friedy" Products

ACCEPT THE INVITATION TO TRY FOR 30 DAYS—

"THE HU-FRIEDY LIMITED"

A set of Nine Elevators for all cases of extraction.

Made of IMMUNITY STEEL

Not a one man's technique—but—the technique of the future suggested by prominent exodontists.

Each set is accompanied with a description of the technique as furnished us by the designers of the Elevators.

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Ask for a copy of our latest catalogue.

THE HUGO FRIEDMAN MFG. CO.

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The New Castle Sterilizer

Without Fuse Pins

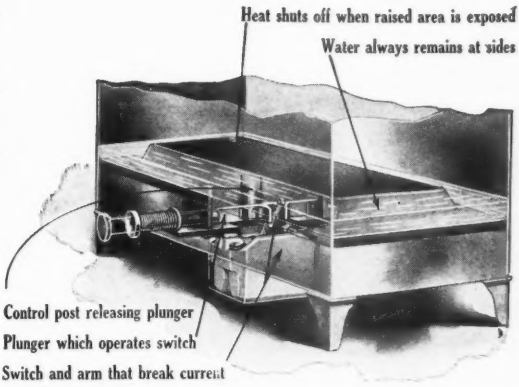
The new Castle cut-off operates without fuse pins.

There is no thermostatic metal—nothing to adjust.

Current Shuts off while there is yet water.

Your instruments are protected.

CASTLE


Heat shuts off when raised area is exposed
Water always remains at sides
Control post releasing plunger
Plunger which operates switch
Switch and arm that break current

Let the New Castle be a Christmas present to yourself

WILMOT CASTLE CO., 1148 UNIVERSITY AVE., ROCHESTER, N. Y.

Makers of the only complete line of Dental, Medical and Surgical Sterilizers

Your Christmas Gift to Yourself!

The dentist who wishes to make himself a present both useful and attractive may well decide on several

ANGELICA DENTAL SMOCKS
Sold Direct-from-Factory-to-User

His assistant will enjoy wearing an Angelica Assistant's Gown. Both the garments—illustrated here—are attractive in design, durable in construction and comfortable in every way; are made of white twill and fitted with indestructible buttons. In addition our direct-from-factory prices mean full value for your money.

Order from this ad TODAY—money back if not satisfied.

Dentist's Smock 41TH.8—with elbow or wrist-length sleeves $2.00
Assistant's Gown 31TH.0 ..... 1.95

State chest measure for coats; bust for dresses. When ordering either of these styles add 25 cents for postage.

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Established 1878

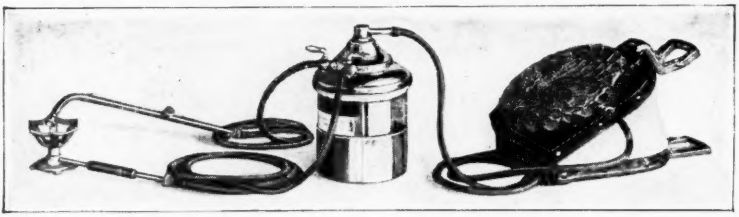
Dentist's Coat Style 41TH.8

ST. LOUIS
1412 Olive St.

NEW YORK
Dept. D. 29 East 31st St.

Assistant's Dress Style 31TH.0

ORDER FROM NEAREST POINT



THE BETZCO BLOW PIPE OUTFIT

The following distinctive features make this Blow Pipe Outfit practical, efficient and dependable:

1. Only one connection between generator and blow pipe.
2. The blow pipe proper has a second mixing chamber, which produces a more perfect mixture of gas and air than is possible with a single mixture.
3. The gas supplied through blast tube is the same as burned in flame tube. Pressure, no matter how great, can therefore produce no chemical difference in flame.

Any size flame can be produced by regulating thumb valve. The case heater keeps your case at a uniform heat while soldering, thus avoiding the unpleasant results which often attend the operator's attempts to turn from the large brush flame to the fine needle flame used for flowing the solder. Complete outfit contains gas generator, blow pipe, bellows, heater, and all necessary tubing.

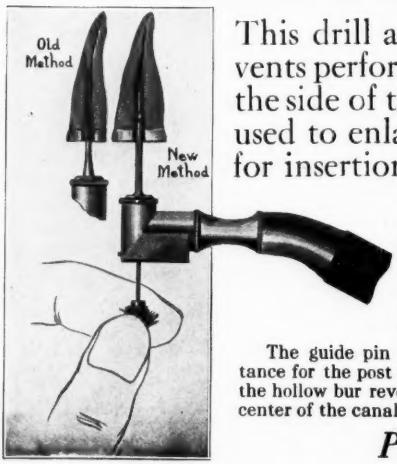
5ND4300.	Outfit, complete, price	$14.00
5ND4301.	Blow Pipe only, price	2.00
5ND4302.	Gas Generator only, price	6.50
5ND4304.	Gas Heater only, price	.65
5ND4306.	Bellows only, price	7.00

FRANK S. BETZ COMPANY

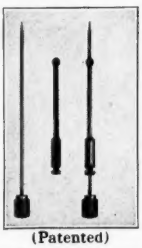
HAMMOND, INDIANA

NEW YORK **CHICAGO**

Dr. Craig's Non Perforating Root Canal Drill



This drill absolutely prevents perforation through the side of the root, when used to enlarge the canal for insertion of a post.



(Patented)

In using this safety drill, the guide pin is inserted in the root canal the distance required for the post.

Remove the guide pin from the canal, placing it through the hollow bur which is in the handpiece.

The guide pin is placed in the canal the required distance for the post and securely held with the fingers while the hollow bur revolves around it and is guided through the center of the canal, thus preventing perforation.

Price each, $1.00 **Order direct or through your dealer**

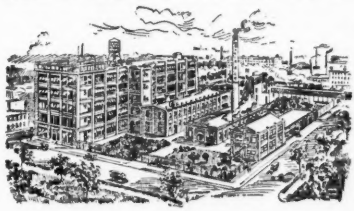
DR. JOS. E. CRAIG

738 BROADWAY - - - GARY, IND.

A Word on Chayes' Golds and Their Manufacture

THE formulae for casting golds evolved by the painstaking research and scientific experiment of Herman E. S. Chayes, D.D.S., are nicely adapted to the class of work taught by their originator. These golds all contain platinum and are manufactured solely by us. This is, in itself, a guarantee of their absolute uniformity—a uniformity attainable only through manufacture in a large way and with the most modern equipment obtainable. The size of our plant pre-supposes the first, while our equipment of apparatus goes a little beyond even the word "modern" for much of it is exclusive.

And this is a description of the golds themselves: Chayes' A, for inlays in children's teeth, and those of adults where these are in normal occlusion. Chayes' B, for cast bases and for inlays in teeth of adults where these are in abnormal occlusion. Chayes' C, for inlays in teeth which are to be used as abutments. Chayes' D, for small and Chayes' E for large saddles.



We shall be glad to answer your questions, doctor.

BAKER & CO., Inc.,
54 Austin St., Newark, N. J.
5 So. Wabash Ave., Chicago
30 Church St., New York

THE ORIGINAL ZINC CHLORIDE MOUTH WASH

Efficiency First!

LAVORIS

It is this Particular Combination with Zinc Chloride that gives such Therapeutic Value.

LAVORIS CHEMICAL CO.
MINNEAPOLIS, MINN., U.S.A. TORONTO, ONT., CAN.

THE HEALING ANTISEPTIC

ANNUAL CLINIC

of

CHICAGO DENTAL SOCIETY

will be held at

HOTEL DRAKE, CHICAGO

JANUARY 18, 19, 20, 1923

Dealers and Manufacturers desiring exhibit space please communicate with

DR. JOHN H. CADMUS

1417 Marshall Field Annex, Chicago

Let Your Assistant Standardize Your Technic!

This means BETTER RESULTS in LESS TIME!

AND SO EASY TOO! Place mold in oven heated to 650; remove in 18 minutes and cast; THAT'S ALL THERE IS TO IT!

MAKE OVERS ARE EXPENSIVE!

TO CEMENT AN INLAY THAT DOES NOT FIT IS CRIMINAL!

AVOID BOTH BY USING A STANDARDIZED TECHNIC! THE DIXIE OVEN absolutely STANDARDIZES your technic, thereby PREVENTING ALL FAILURES CAUSED BY TOO MUCH HEAT OR IMPERFECT CARBONIZATION.

Price; $13.50 Including Thermometer!

Dixie Ovens are adjustable to any GAS, PRESTOLITE OR GASOLINE BURNER.

If your Dealer RIP VAN WINKLES, WRITE US DIRECT.

For further information and article on "Failures in casting and how to overcome them" Address

The Dixie Dental Manufacturing Company

Brown Marx Bldg. **Birmingham, Ala.**

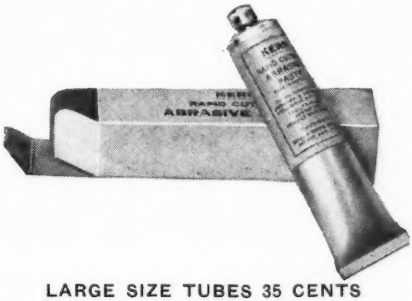
Get Results by Advertising in THE JOURNAL

KERR

REG. U. S. PAT. OFF.

Rapid-Cutting

"ABRASIVE PASTE"



LARGE SIZE TUBES 35 CENTS
AT ALL LEADING DENTAL DEPOTS

KERR RAPID CUTTING ABRASIVE PASTE is used for the grinding in and correcting of imperfections in occlusion and articulation of artificial teeth.

This preparation does not contain any vaseline, glycerine or any other grease, and therefore can be readily washed off in cold water.

Put up in a convenient form, it is an economical and rapid method of correcting inaccuracies of occlusion that creep in during the process of vulcanization over which the plate maker has no control.

Manufactured by

DETROIT DENTAL MANUFACTURING CO.

Detroit, Michigan

"IT IS IMPOSSIBLE TO MAKE CAST GOLD INLAYS FIT CAVITIES WHERE EVEN MINUTE UNDERCUTS EXIST".

Dr. W. J. Meier's Point Truing Abrasives are used with special mounted points. These enable you to eliminate undercuts and produce smooth patterns without protrusions. Such protrusions, before being ground away, prevent the inlay from seating. After being ground away they frequently prevent the inlay from being used at all.

The initial cause for all these false steps may be traced to faulty grinding.

Dr. W. J. Meier's Point Truing Abrasives will save time and insure more accurately fitting inlays.

Price of outfit, including 3 mounted points for cutting, 3 for polishing and 2 boxes of abrasives, $2.50.

F. W. HANCOCK, 25 E. Washington St., Chicago, Ill.

Alcasco Laboratory Work Bench

From Floor to Working Top.....36 inches
Working Top.....16 x 36 inches

Just What You've Been Looking For

A compact, neat appearing work bench designed for the present day restricted working space and combining all the essential features of the larger model, including asbestos top and metal lined gold drawer. In Mahogany or Oak, just as illustrated. Price, F. O. B. Chicago **$37.50**

ALEXANDER CASSRIEL COMPANY

128-132 So. Wabash Avenue **CHICAGO**

IN ACIDOSIS

All the bases of the body are drawn upon (not only sodium) and lost from the body. When only sodium bicarbonate is given the loss of the other bases is not made up.

The use of KALAK WATER makes possible the administration of the several bases in agreeable form—an important matter when patients must take alkalies for longer periods.

Each bottle carries in sparkling form several grammes of the bicarbonates of sodium, potassium, calcium and magnesium.

Kalak Water Company of N.Y.

23 City Hall Place **New York City**

Elmira, New York

To the Dental Profession.

Gentlemen:

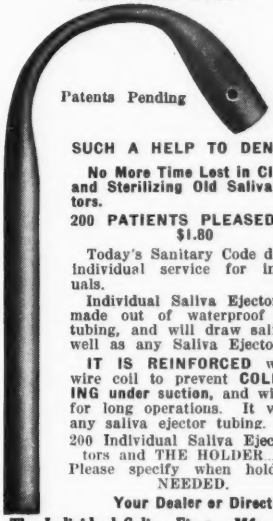
For the past twelve months we have made you, through these pages, our offer of a free bottle of Frostilla Fragrant Lotion. The widespread and growing response has been very pleasing but even more gratifying are the letters of appreciation received from prominent members of the dental profession. We are proud to know that we are being instrumental in aiding the dentist in his splendid work.

This letter closes our year. May we express once more our sincere admiration for the members of the dental profession, not only for their mechanical efficiency, their wide technical knowledge, but also for the splendid fight they have won in establishing the highest ethical standards in this newest branch of surgery, and finally for their wonderful record of voluntary service. Nowhere has there been more spectacular progress, no profession has contributed more to the health of the nation and consequently to America's prestige.

Gentlemen, we thank you for your attention. We continue to extend our co-operation and wish you in 1923 another year of brilliantly successful achievement.

Yours faithfully,
The Frostilla Company

Dr. Riddle's Individual Saliva Ejector
Used By
MOST PROGRESSIVE DENTISTS THE WORLD OVER



SUCH A HELP TO DENTISTS

No More Time Lost in Cleaning and Sterilizing Old Saliva Ejectors.

200 PATIENTS PLEASED FOR $1.80

Today's Sanitary Code dictates individual service for individuals.

Individual Saliva Ejectors are made out of waterproof paper tubing, and will draw saliva as well as any Saliva Ejector.

IT IS REINFORCED with a wire coil to prevent **COLLAPSING under suction,** and will last for long operations. It will fit any saliva ejector tubing.

200 Individual Saliva Ejectors and THE HOLDER...**$1.80**
Please specify when holder is NEEDED.

Your Dealer or Direct

The Individual Saliva Ejector Mfg. Co.
St. Francisville, La.

Soap or tooth-paste *cannot* do the work. Kitchen scourers ruin and roughen the rubber

Caulk DENTURE CREAM

Cleans *false* teeth

Prescribe *the* ONLY REAL cleanser

Sold in dental depots and drug stores

Send for samples
THE L. D. CAULK CO., Milford, Del.

FIVE FACTS
about
MERCITAN

1. Germicidal in Presence of Pus

Tests against Staphylococcus Pyogenes Aureus: in presence of partially hydrolized albumins (comparable to decomposing material in pus) show that Mercitan Cream in dilutions up to 500 kills all organisms in 15 minutes. Mercitan Fluid in dilutions up to 100 kills all organisms in 30 minutes.

2. Germicidal in Oral Fluids

Tests against Staphylococcus Pyogenes Aureus: in presence of saliva, show that Mercitan Cream in dilutions up to 200 kills all organisms in 15 minutes. Mercitan Fluid in dilutions up to 50 kills all organisms in 15 minutes. Mercitan Cream is an efficient germicide in dilutions up to 400 and Mercitan Fluid is thoroughly efficient under these conditions.

3. More Penetrating Than Iodine

Mercitan has power to penetrate colloidal fluids of body tissues. Mercitan Fluid is equal to iodine in penetrating power. Mercitan Cream is far *superior* to iodine.

4. Not Toxic to Living Tissues

Toxicity tests on cell tissue by the method of tissue cultivation show that concentrated solutions of Mercitan Cream and Mercitan Fluid are less toxic than Dakin's Solution. High dilutions of Mercitan Fluid actually stimulate the growth of cell tissue.

5. Germicidal in Dilute Solutions

Tests against Staphylococcus Pyogenes Aureus—organic matter absent—show that Mercitan Cream in dilutions up to 1000 kills all organisms in 15 minutes. Mercitan Fluid in dilutions up to 250 kills all organisms in 15 minutes. Mercitan Cream is an active germicide in dilutions up to 10,000, while Mercitan Fluid is active in dilutions up to 1000.

ALL THE FACTS *about Mercitan will be sent on request to any dentist, physician or student*

Write today

THE L. D. CAULK COMPANY

MILFORD, DELAWARE

An Excellent Aid in Pyorrhea

WICOMB'S

The Original Ipecac

Tooth Paste

Try it on your next case

Containing 5 per cent (Acid Free) Standardized, Fluid Extract of Ipecac. Strongly Amebicidal and Highly Recommended in the Co-operative Treatment of Pyorrhea Alveolaris.

By virtue of the prophylactic and antiseptic qualities of Wicomb's Ipecac Tooth Paste, its daily use is a safeguard against re-infection and recession. Effective in gingivitis and all inflammatory conditions of gum tissue. **Antiseptic—Cleansing—Anti-Acid.**

Trial Tubes on request

The Wicomb Dentifrice Co.

New Orleans, La.

Austin's Synthetic Stone

a cast material when once used secures for the Austin Manufacturing Company a regular customer because it combines all the desirable qualities that go to make up an ideal cast material with the one great advantage of setting in twenty minutes.

AUSTIN'S CAST COATING makes a splendid separating media and when used as a cast coating assures a smooth surface to your vulcanite and eliminates the necessity for tin foil.

9 Lb. Can .....$ 2.00

100 Lb. Drum..... 15.00

Cast Coating 50c per bottle

Order from your regular dealer or direct

Austin Manufacturing Company

James Bldg.

Chattanooga, Tennessee

Every Advertisement Guaranteed

That problem of filling the canal

The problem of knowing when a pulp canal is filled and filled full is solved when you use

Radiopaque

When a canal is filled with Radiopaque the filling registers on the X-Ray plate. If the canal is not filled full the filling is readily removed, another filling is inserted and another X-Ray made. Guesswork is out.

$2.00 – all dealers

Lee S. Smith & Son Manufacturing Co.
Pittsburgh, U. S. A.

IPANA TOOTH PASTE

Heals Bleeding Gums

You will agree with the verdict of thousands

—that Ipana cleans and polishes the teeth thoroughly and without harm.

—that Ipana, because of its Ziratol content, corrects soft and spongy gums and heals bleeding gums.

—that Ipana has a smooth, snappy and delightful flavor —a treat to children and a pleasure to grown-ups.

You and Your Patients Should Know and Use IPANA

A Professional Sample awaits your card.

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New York City
Makers of
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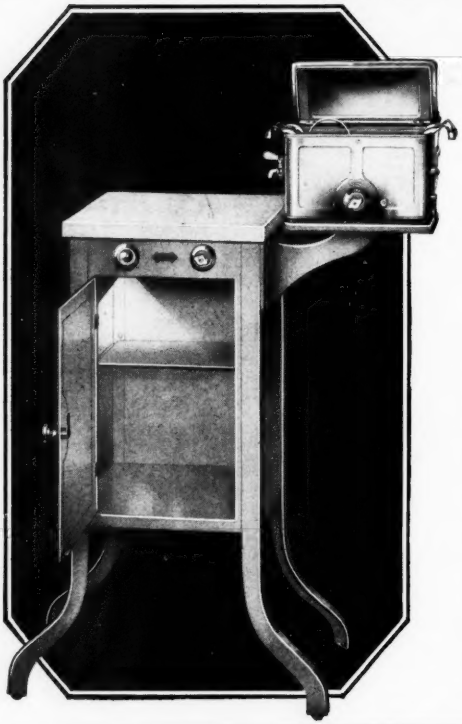

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Cabinet Table

No. 211
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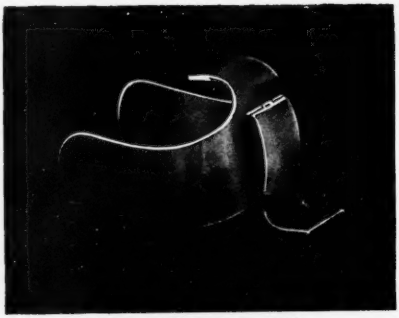

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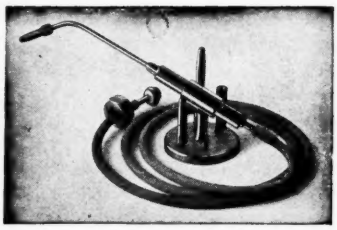

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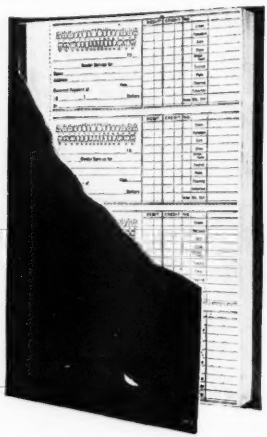

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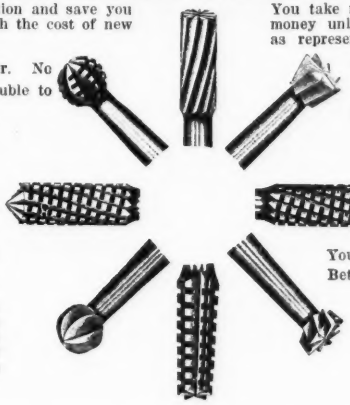

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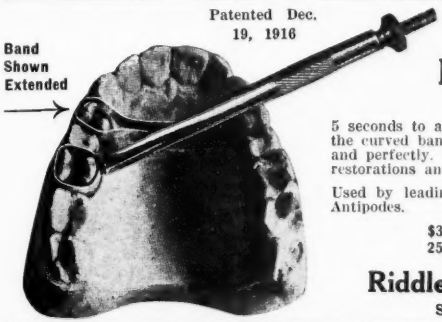

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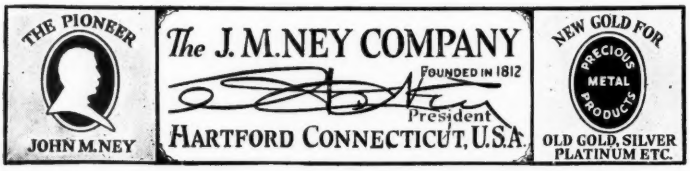

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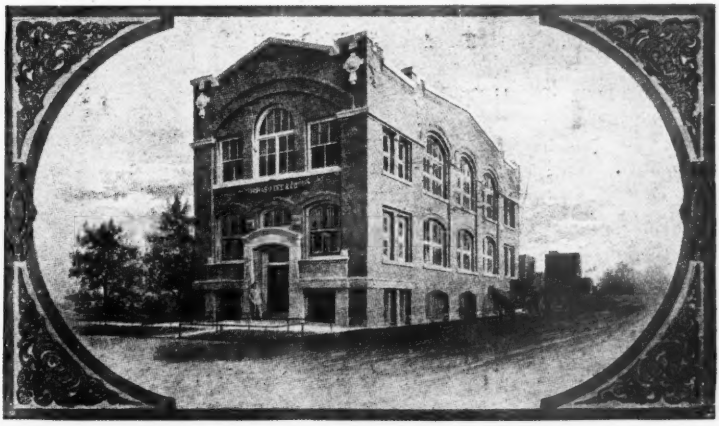

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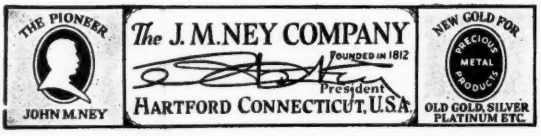
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